"Aber immer alle sagen das"
The Status of V3 in German: Use, Processing, and Syntactic Representation

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Zusammenfassung

Für das Deutsche wird gemeinhin eine strikte V2-Beschränkung angenommen, die für deklarative Hauptsätze besagt, dass sich vor dem finiten Verb genau eine Konstituente befinden muss. In der Literatur werden häufig Beispiele angeführt, in denen sich zwei Konstituenten vor dem finiten Verb befinden und die somit gegen die V2-Beschränkung verstoßen. Diese syntaktische Konfiguration, so das Argument, führt zu Ungrammatikalität:

(1) *Gestern Johann hat getanzt. (Roberts & Roussou 2002:137)

Die Bewertung in (1) fußt jedoch nicht auf empirischer Evidenz, sondern spiegelt ein introspektives Urteil der Autor*innen wider. Daten zum tatsächlichen Sprachgebrauch zeigen, dass Sätze wie in (2) im Deutschen durchaus verwendet werden:

(2) Aber immer alle sagen das. [BSa-OB, #16]

Die Dissertation beschäftigt sich mit dem Status dieser V3-Deklarativsätze im Deutschen. Der Status wird aus drei einander ergänzenden Perspektiven auf Sprache untersucht: Sprachverwendung, Akzeptabilität und Verarbeitung. Hierzu werden Daten, die in einer Korpus-, einer Akzeptabilitäts- und einer Lesezeitstudie erhoben wurden, ausgewertet. Basierend auf den empirischen Befunden diskutiere ich V3-Modellierungen aus generativer Sicht und entwickle einen Modellierungsvorschlag aus konstruktionsgrammatischer Sicht.

Die Arbeit zeigt, dass die Einbeziehung von nicht-standardsprachlichen Mustern wichtige Einblicke in die sprachliche Architektur gibt. Insbesondere psycholinguistisch gewonnene Daten als empirische Basis sind essenziell, um mentale sprachliche Prozesse zu verstehen und abbilden zu können. Die Analyse von V3 zeigt, dass solche Ansätze möglich und nötig sind, um Grammatikmodelle zu prüfen und weiterzuentwickeln. Untersuchungen dieser Art stellen Grammatikmodelle in Frage, die oft einer standardsprachlichen Tradition heraus erwachsen sind und nur einen Ausschnitt der sprachlichen Realität erfassen. V3-Sätze entpuppen sich nach dieser Analyse als Strukturen, die fester Bestandteil der Grammatik sind.

Abstract

German is usually considered to follow a strict V2-constraint. This means that exactly one constituent must precede the finite verb in declarative main clauses. There are many examples for sentences that exhibit two preverbal constituents in the literature, illustrating a violation of the V2-constraint. According to the literature, these configurations lead to ungrammatical structures.

(1) *Gestern Johann hat getanzt. (Roberts & Roussou 2002:137)

However, the evaluation in (1) is not based on empirical evidence but is introspective and thus might not reflect the linguistic reality. Empirical data from actual language use show that German speakers indeed use these kinds of sentences.

(2) Aber immer alle sagen das. [BSa-OB, #16]

The dissertation explores the status of these V3 declaratives in German, with 'status' comprising three complementary perspectives on language: language use, acceptability, and processing. To this end, I analyze data from three studies: a corpus study, an acceptability judgment study, and a reading time study. Based on the empirical evidence, I discuss existing analyses of V3 and V3-modeling from the generative perspective and develop an analysis taking a construction-based approach.

The dissertation shows that including patterns from non-standard language allows for valuable insights into the architecture of language. In particular, psycholinguistic data as an empirical basis are essential to understand and model mental linguistic processes. The analyses presented in the dissertation show that it is possible to follow such an approach in the field of syntactic variation, and it is indeed necessary in order to challenge and further develop existing grammatical theories and our understanding of grammar. Most grammatical models strongly rely on standard language, which is why they only capture a snippet of the linguistic reality. Taking empirical evidence into account, however, V3 sentences turn out to form an integral part of the German grammar.

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Chapter 1: Introduction

1.1 The V2 constraint revisited

German is usually considered to follow a rigid V2 constraint. This means that the finite verb is placed in the second position in declarative sentences, wh-interrogatives, and specific kinds of imperatives and exclamatives. According to this constraint, exactly one constituent has to precede the finite verb. In accounts of German syntax, this is a prevalent assumption:

> Das Vorfeld ist in jedem Hauptsatz besetzt, und zwar mit genau einem Element (das allerdings aus mehreren Wörtern bestehen kann) (Engel 1972: 18)

> Der unmarkierte deutsche Aussagesatz ist ein Verbzweitsatz, d.h. vor dem Verb (bzw. streng genommen dem flektierten Teil der Verbform), muss genau eine Konstituente stehen. (Speyer 2009: 323)

> Declarative main clauses contain exactly one constituent in front of the left bracket (the prefield). (Bader & Häussler 2010: 719)

Accordingly, the literature often provides illustrations of this constraint through constructed examples for sentences that display "ungrammatical" word orders, such as in (1):

(1) a. *Gestern der Lehrer hat den Kindern dieses Buch gegeben. (Rambow & Lee 1994: 11)
b. *Gestern Johann hat getanzt. (Roberts & Roussou 2002:137)

These sentences display an ADVERBIAL >> SUBJECT >> FINITE VERB linearization, and hence, two preverbal constituents. In the literature, these sentences are marked as "ungrammatical", and they are not empirically motivated but constructed. Even though empirical evidence becomes more and more important in linguistic research, numerous researchers still take invented sentences such as in (1) as evidence for a specific rule or constraint. The validity of this kind of evidence is questionable since these grammaticality judgments are introspective and might not reflect actual language use. This is precisely the case for sentences like in (1). The sentences are characterized as violating a rigid V2 constraint, even though they do occur in everyday German:

(2) Aber immer alle sagen das. [BSa-OB, #16]

As opposed to (1), (2) reflects actual language use and provides empirical evidence for a deviation from the V2 constraint. Hence, the example illustrates that there are indeed structures that exhibit deviations from V2 with an ADVERBIAL >> SUBJECT >> FINITE VERB linearization. Consequently, in previous studies, some researchers explicitly stated that the preverbal area, the German *prefield*, is much more complex than what the V2 constraint implies:

> Es wird allgemein angenommen, daß diese erste Position (das Vorfeld) im Aussagesatz nur durch e i n Satzglied besetzt wird […] Tatsächlich hat dieses Kriterium nur eine bedingte Geltung […] [Das Vorfeld kann] auch durch mehrere Elemente besetzt werden. (Beneš 1971: 160 – 161)

Structures such as in (2), in which two constituents precede the finite verb, and which consequently have the verb in the third position, might be called "V3" structures. There are several other structures that, at first glance, exhibit multiple preverbal constituents. The literature discusses complex prefields (3), apparent multiple prefields (4), V3 with focus-sensitive particles and connectors (5), V3 with concessive conditionals (6), left-dislocations (7), and hanging topics (8).

(3) Vorhin nach dem Essen in deiner Wohnung habe ich mich sehr unwohl gefühlt.
(4) Zum ersten Mal die beste Note bekam sie in der zweiten Klasse.
(5) Nur Sandra kennt die Wahrheit!
(6) Wenn ihr mich braucht, ich bin im Wohnzimmer.
(7) Den Hut, den würde ich an deiner Stelle nicht kaufen.
(8) Den Hut, ich würde ihn an deiner Stelle nicht kaufen.

However, for all of these constructions, there are different explanations as to why they do not violate the V2 constraint: First, the structures form a complex unit and thus only seem to have multiple preverbal constituents. This explanation holds for apparent multiple prefields (cf. Müller 2003, 2005), complex prefields (cf. Pittner & Berman 2010), focus-sensitive particles and connectors (cf. Reis 2005, Meyer & Sauerland 2009, but see Büring & Hartmann 2001, Kleemann-Krämer 2010, Schalowski 2015 for a contrary perspective), and left-dislocations (cf. Grewendorf 2001). Second, the initial element is clause-external, as has been suggested for concessive conditionals (König & Van der Auwera 1988), and hanging topics (Selting 1993, Altmann 1981).

Neither of these explanations holds for Adv-S-V_{fin}, as I will demonstrate in detail in chapter 2. Moreover, Welke (2019: 317) goes as far as to state that the only real cases of multiple prefields are V3 structures of the kind discussed in this dissertation:

> "Wirklich" mehrfache Vorfeldbesetzungen durch Subjekt + Modifikator stehen in einem deutlichen Kontrast zu scheinbar mehrfachen Vorfeldbesetzungen. Wiese/Öncü/Bracker (2017) weisen sie im türkisch-deutschen Sprachkontakt nach.

For these reasons, I only subsume structures with an ADVERBIAL >> SUBJECT >> FINITE VERB linearization such as in (2) as instances of V3.

In the context of multilingualism, V3 sentences have sparked a lively discussion in the research on urban vernaculars in multilingual settings in Europe. They are attested for Kiezdeutsch (9) in Germany (Wiese 2006 et seq.), Rinkebysvenska (10) in Sweden (Kotsinas 1992, 1998, Fraurud 2003), Københavnsk multietnolekt (11) in Denmark (Quist 2000),

multietnolektisk norsk (12) in Norway (Opsahl 2009), and Dutch urban youth variety[1](13) in the Netherlands (Appel 1999, Nortier 2000, Meelen et al. to appear).

(9) Morgen ich geh Arbeitsamt. (Kiezdeutsch, Wiese 2006: 787)
(10) Igår jag var sjuk.
Yesterday I was sick
'Yesterday I was sick.' (Rinkebysvenska, Kotsinas, 1998: 137)
(11) Normalt man går på ungdomsskolen.
normally one goes to youth.club
'Normally you attend the youth club.' (Københavnsk multietnolekt, Quist, 2008: 47)
(12) Nå de får betale.
now they get/must pay
'Now, they must pay.' (Opsahl 2009: 133)
(13) Hier je bent verzekerd.
Here you are insured
'Here you are insured.' (Meelen et al. to appear: 6)

All of these varieties are predominately used in peer-group situations by adolescents in urban areas. These areas are characterized by ethnic[2] and linguistic diversity, i.e., the majority language is in contact with several other languages that speakers of multiethnolects may also speak at home. Kiezdeutsch was the first German variety for which V3 was systematically described.

The pattern is also reported for Germanic contact varieties outside of Europe, for instance, Namibian German (Wiese & Müller 2017), American Norwegian (Alexiadou & Lohndal 2018), and Texas German (Blevins & Bunk 2016). The fact that V3 occurs in these varieties suggests that multilingualism is a crucial factor in the emergence of V3. Also, in the context of Kiezdeutsch, V3 is often perceived as a characteristic pattern that emerged from language contact. In both the global and the German setting, multilingualism is thus often considered to be one of the triggers for deviations from the V2 constraint, a constraint that is argued to be deeply rooted in German. However, V3 is also present in the German of speakers who grew up in monolingual households (Wiese 2013). This fact is often neglected in many studies (see te Velde 2016, Hinterhölzl 2017), and it calls some of the existing accounts of V3 into question. V3 in monolingual speakers indicates that the structure is part of German grammar and that V2 is not as strict as frequently advocated in the literature.

[1] The picture in Dutch is not as clear as in the other contexts. Freywald et al. (2015) only find three examples of V3 in their case studies. The authors trace this fact back to the possibility that Dutch might be a stricter V2 language than German, Norwegian, and Swedish. Other explanations are different sizes of the corpora and methodologic differences in the elicitation of the data. In line with the second explanation, Meelen et. al (to appear) found systematic occurrence of Adv-S-V_{fin} in L1 Dutch adolescent speakers with Berber and Arabic family languages in urban, multilingual settings, indicating that V3 indeed also occurs in Dutch multiethnic varieties.

[2] "Ethnic" is to be understood as a social construct rather than a bundle of features that a person inherits. For a detailed discussion of the term cf. Wiese (2015).

This point is highly relevant in the discussion of verb placement in German and the status of structures that deviate from standard German word order patterns. If German is a language with a strong V2 preference in declaratives while at the same time allowing for deviations from V2, one might ask: What is the status of V3 declaratives in German? This question will be the main research question guiding the dissertation. By *status* I mean characteristics that V3 displays in the areas of language use (including acceptability), language processing, and syntactic representation. Investigating the status of V3 and comparing it with the status of V2 declaratives can give us an insight into how V3 is situated in the linguistic system of German. V3 could, for example, share characteristics with V2 and could follow general principles of language and German grammar. However, it could also deviate completely from what we know so far. In this dissertation, I argue for an account of V3, where this pattern shares many similarities with V2, and systematically follows the rules of German grammar. Furthermore, V3 obeys general preferences that have been observed in studies on sentence processing. Since the *cognitive turn* in the 1960s, researchers agree that language is not an abstract system untouched by mental processes but is rooted in the cognitive system. Thus, experimental studies focusing on the interface of language processing and production are extremely important and revealing for linguistic theory building. In the next section, I describe how language processing contributes to our understanding of the status of V3 in German.

1.2 The processing of V3 and its relevance for grammatical theory

The studies dealing with V3 predominantly focus on a syntactic description of the structure, and recently, generative syntax provided several promising analyses in this vein (cf. te Velde 2016, Walkden 2017). The studies draw on empirical evidence from corpus studies, and thus, they provide valuable insights into structural and functional aspects of V3 structures from the perspective of language use. However, psycholinguistic considerations in terms of language processing are still missing. Psycholinguistic research has been proven to be particularly fruitful for our understanding of how grammar is mentally represented (cf. among many others Piñango et al. 1999, Piñango 2006, Wittenberg & Piñango 2011, Cohn et al. 2014, Wittenberg et al. 2014, Pinker & Jackendoff 2009, Wittenberg & Jackendoff 2018). Sentence processing can give crucial insights into how grammar is represented in the cognitive system, as it shows us how language is used in real-time and thus illustrates immediate mechanisms of the human parser. Hence, it sheds light on how humans deduce the meaning of an utterance represented in

the mental lexicon when being exposed to a certain linguistic input[3]. The challenging part for grammatical theory is to explain how the relationship between the input and the comprehension of what is meant by the input can be modeled through grammar. Jackendoff (2007: 2 – 3) states:

> A linguistic theory is an account of the repertoire of utterances available to a speaker, including the finite repertoire of material stored in long-term memory and the principles by which novel utterances are related to the stored repertoire. It abstracts away from the real time aspects of language processing and from the distinctions between perception and production. All else being equal, a linguistic theory is to be preferred if it embeds gracefully into an account of language processing, and if it can be tested in part through experimental techniques as well as through grammaticality judgments.

Consequently, it is essential to include psycholinguistic research in linguistic theory building. An example of how psycholinguistics can contribute to linguistic theory building is applying psycholinguistic methods to the analysis of V3 declaratives in German. From the perspective of grammatical theory, the structure challenges traditional and recent proposals concerning the V2 constraint in German. V3 constitutes an instance of a naturally occurring V2 deviation and thus a theory of grammar needs to explain under which grammatical, contextual, or functional conditions V3 occurs. In addition, it needs to allow for modeling these patterns within the grammatical framework. A theory of grammar can greatly benefit from psycholinguistic data, including data that involves peripheral phenomena outside the standard language, such as V3. Only by considering these kinds of data can we acquire a comprehensive description of grammar.

In the domain of grammatical theories, in this dissertation, V3 functions as a test case asking how its syntax can be modeled, taking into account psycholinguistic evidence. Linguistic theories consider psycholinguistic evidence to different degrees; while mainstream Generative Syntax rarely relies on psycholinguistic data, some schools in Construction Grammar explicitly claim to be psychologically plausible. This dissertation focuses on two mainstream grammatical frameworks: Chomskyan Generative Grammar and Cognitive Construction Grammar. Generative analyses investigate rules that lead to the derivation of sentences from underlying patterns, with syntax being the core of the grammatical system. On the other hand, construction-based accounts deal with the emergence of form-function pairings (=constructions) as conceptualized, cultural signs. Even though Generative Grammar is primarily interested in aspects of core syntax, much work in modeling V3 has been done in the generative framework. So far, however, psycholinguistic evidence has been excluded in these studies. Surprisingly,

[3] Sentence processing often refers to spoken or written language. However, linguistic input can also be non-verbal.

construction-based accounts that are particularly interested in such phenomena on the periphery of grammar have so far not examined V3 declaratives.

In psycholinguistics, patterns outside the standard language have a great potential for furthering our knowledge on language use and linguistic processing. V3 declaratives reflect naturally occurring structures, which can greatly reveal how the processing system copes with word order variation. V3 is a pattern that bluntly goes against the most frequent declarative word order pattern and thus it is an outstanding case in point for investigating how syntactic variation is mentally represented. However, testing such peripheral phenomena is, in many cases, challenging. Most of these phenomena require specific conditions that cannot be easily controlled for in experiments. Testing V3 in a psycholinguistic study, for example, is rather unorthodox since the pattern is restricted to specific contexts; it only occurs in informal situations and, at least in monolinguals, mostly in spoken language. Additionally, V3 sentences are far from ideal when it comes to psycholinguistic testing. Schlesewski et al. (2000: 67ff.) state that testing declaratives is generally problematic. However, the investigation of this pattern can be most rewarding: In bringing together empirical data with grammatical theory, we might bridge syntax theory with psycholinguistics and combine both fields to provide an accurate, empirically based model of grammar. The necessity of bringing together empirical data with grammatical theory is of great value to grammatical theory building and testing grammatical theories.

In sum, this dissertation investigates the status of V3 as a declarative sentence structure in German. It considers theoretical discussions, empirical offline evidence, and psycholinguistic online evidence. Besides, it evaluates different theories of grammar through empirical data from those psycholinguistic experiments and investigates how V3 can be modeled in different grammatical frameworks. By doing so, it brings together language processing and syntactic representation.

1.3 Research questions and structure of the thesis

From the sections above, the main research question that emerges is the following:

main RQ:
What is the status of V3 declaratives in German?

In pursuit of this question, I address four more specific questions (RQ1 – RQ4):

RQ 1: What are the structural and functional properties of V3?

Typically, declaratives in German show the verb in the second position with one constituent preceding it. This constituent has specific grammatical properties, and the preverbal position, the prefield, comes with several functions. The prefield mediates between the previous discourse and the following linguistic material; hence it is multifunctional and dynamic, making it especially interesting to look at in the discussion on the status of V3. To explore the status of V3 declaratives, I will compare properties of V2 with properties of V3. This can tell us whether patterns are at work in V3 that also apply to V2 or whether V3 is different. To make this investigation possible, it is first of all essential to investigate grammatical and functional aspects of V3 itself. In addition to a summary and discussion on previous research, I present a corpus study in which I explicitly focus on V3 in monolingual speakers[4]. This contributes to a further understanding of the pattern since, so far, most information on the structural and functional properties for V3 has predominantly been inferred from data on multilingual German speakers.

RQ 2: How acceptable is V3?

Investigating the acceptability of V3 further extends our picture of V3 in language use, since it shows whether V2 deviations are acceptable in a setup tapping into metalinguistic evaluation, and if so, what the status of the V3 pattern is in this context. To test this, I compare the attested V3 structure, using stimuli that build on findings from RQ1, with an unattested V3 pattern, namely ADVERBIAL > OBJECT > FINITE VERB linearizations$_{n,}$ and with three V2 patterns: subject-initial, object-initial, and adverbial-initial V2.

RQ 3: How is V3 processed?

To gain an insight into the status of V3 in processing, I investigate how the parser deals with V3 sentences. I present results from a self-paced reading experiment with monolingual speakers of German focusing on the preverbal constituents and the verb as the main areas of interest for our objective. Targeting V3, I compare this pattern to the same patterns as in the acceptability study, i.e., V2 sentences and Adv-O-V_{fin} sentences.

RQ 4: How can the grammar of V3 be modeled?

This question targets the modeling of V3 based on an integration of the results for questions 1 and 3, that is, grammatical theory and sentence processing. I apply the findings from the

[4] The term "monolingual" naturally is highly debatable and much more complex than presented in this dissertation. However, the term only serves the purpose of referring to people whose family language is German and there are no other languages that the participants grew up with.

empirical studies, exploring how different grammatical theories are equipped to explain the processing data.

The dissertation is structured in the following way: In chapter 2, I target RQ 1, describing V3 in language use. I start by providing evidence for why V3 declaratives must not be considered errors in speech production and why they are not similar to ASVO in language learners. Drawing from the literature on V3 structures, I then provide an overview of the prosodic, syntactic, semantic, and functional properties of V3 and discuss the role of information structure. In addition, the chapter includes a corpus study that reveals further structural properties of V3 not yet discussed in the literature. Besides providing a detailed insight into the structure and function of V3, the chapter serves the methodological purpose of providing information about which properties stimuli that are tested in further studies need to have in order to function as authentic stimuli. Thus, chapter 2 provides a crucial basis for the studies conducted and presented in the following chapters to explore the status of V3, i.e., its behavior in acceptability, processing, and grammatical modeling.

Chapter 3 further builds on the findings from section 2. The chapter presents findings from an acceptability judgment task in which I tested Adv-S-V_{fin}, unattested Adv-O-V_{fin}, and V2 sentences. The most relevant finding from the study is that Adv-S-V_{fin} differs from Adv-O-V_{fin} in acceptability, indicating that Adv-S-V_{fin} has a different status than Adv-O-$V_{fin.}$ The data imply that not all V3 are equally unacceptable, but some, e.g., Adv-S-V_{fin}, fulfill specific requirements that makes them more acceptable than others. The chapter also shows that the stimuli that were used are fit for testing in the self-paced reading experiment. Adv-S-V_{fin} and object-initial V2 are shown to fulfill specific properties in order to be perceived as acceptable (or more acceptable than Adv-O-V_{fin} in the case of Adv-S-V_{fin}) and authentic. If sentences are low in acceptability because these properties are not fulfilled, this could affect reading times and skew the data. However, the study shows that in the relevant conditions, the stimuli displayed the degree of acceptability that was expected from the setup and that qualified the stimuli to be fit for further testing.

In chapter 4, I present the self-paced reading experiment that forms the empirical heart of the dissertation. First, I focus on fundamental aspects in sentence processing theory, summarizing different assumptions for the human parser and influential factors of sentence processing, such as frequency and context. I point out relevant findings concerning the processing of the prefield and the processing of verbs in declarative clauses. Then, I present the data and interpret them against the backdrop of psycholinguistic theories. I show that Adv-S-V_{fin} differs from Adv-O-V_{fin} in terms of reading times in several regions (e.g., in the overall

processing, in processing the preverbal constituent, the verb, and postverbal constituents). The data indicate that processing Adv-S-V_{fin} is less problematic for the parser than Adv-O-V_{fin}. Adv-S-V_{fin} even shares many similarities with V2 sentences in processing, which is not the case for Adv-O-V_{fin}. This is of great interest and relevance in terms of exploring the status of Adv-S-V_{fin}. Thus, the study supports that Adv-S-V_{fin} has a different representation than Adv-O-V_{fin}.

In chapter 5, I use the findings from the previous sections to prove how the status of V3 declaratives can be modeled in grammatical theories. For both accounts, I examine how V3 can be modeled given the theoretical background and empirical data from the studies presented before. I focus on Generative Grammar and Cognitive Construction Grammar and present the fundamental assumptions of both grammatical theories. In the case of Generative Grammar, I test previous analyses against the empirical findings from the preceding chapters. I then give evidence for the cartographic and the non-cartographic account with base-generated adverbials and a subject-second restriction. Within the framework of Construction Grammar, I develop an analysis of V3. I argue for V3 as a construction in its own right that can be modeled considering Cognitive Construction Grammar and the Tripartite Parallel Architecture account, making use of a model of construction processing.

Chapter 6 draws broader conclusions concerning the status of V3 and the implications of the study for the fields of syntax theory and psycholinguistics. Furthermore, it provides an outlook for future research. Figure 1 summarizes the structure of the dissertation and the specific function of each chapter. Dashed lines indicate that the secondary outcome of the studies in the respective chapter provides the basis for the studies in the next chapters.

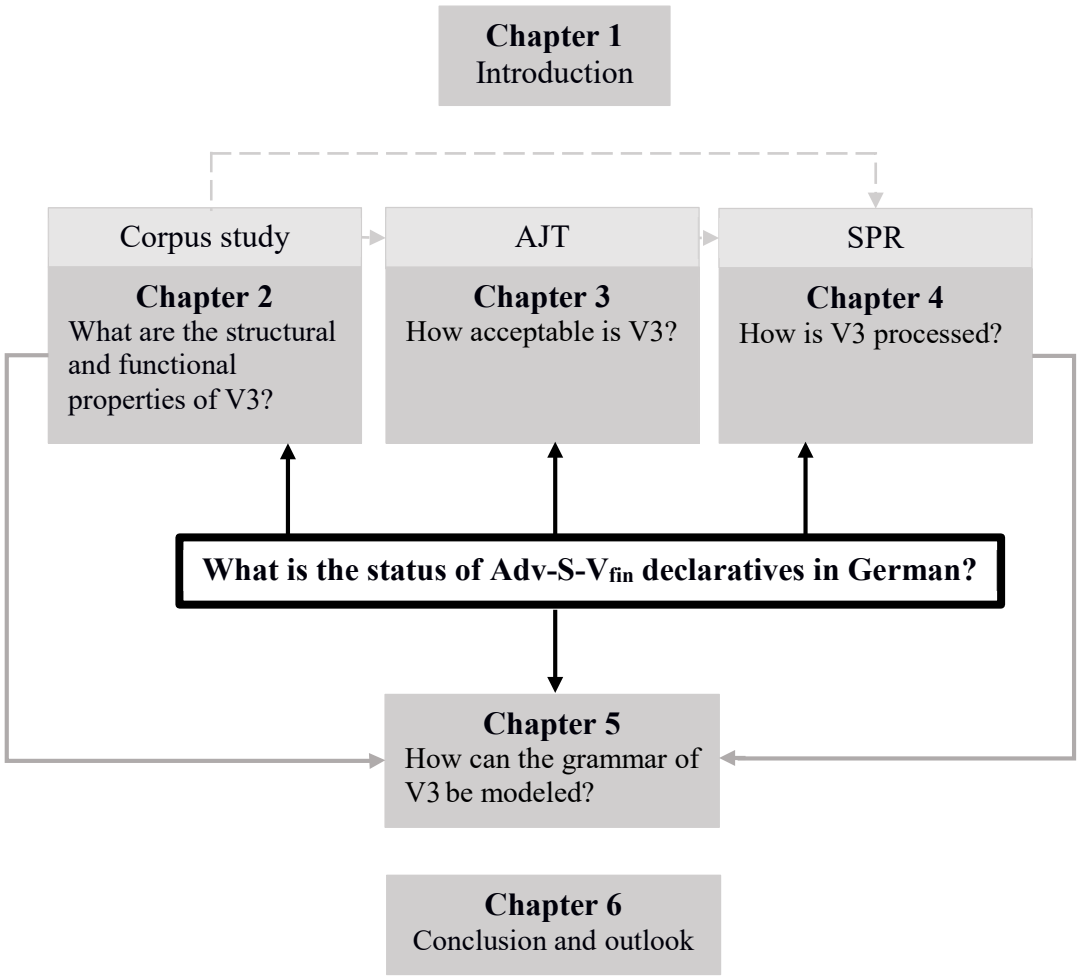


Figure 1: Research questions targeted in the dissertation.

Chapter 2: V3 in language use

This chapter deals with V3 in language use, targeting the first research question of this thesis: What are the structural and functional properties of V3? First, I discuss how Adv-S-V_{fin} differs from speech errors, particularly from self-corrections, and ASVO in language learners. Then, I report on findings concerning the structure and functions of V3 based on the literature. I highlight the role of information structure and discuss a typology of V3 in which V3 is placed on a continuum with frame-setting V3 at one end and discourse-linking V3 at the other. I then support the claim that V3 is motivated by the possibilities that the German prefield offers, drawing from findings on V2 in German. Most of what we know about V3 in language use is derived from the multilingual context since the structures are much more prominent here. However, previous research indicates that most of the findings also apply to V3 in monolinguals (cf. Wiese 2013, Schalowski 2015). This fact is further supported by a corpus study presented in the chapter. In the corpus study, I demonstrate that the previous findings on V3 apply to a sample of collected V3 structures uttered by monolingual speakers. Furthermore, I add to existing findings that V3 mostly occurs with transitive main verbs in present tense with overt objects. Apart from describing the status of V3 from the perspective of language use, the findings were the basis for the development of the stimuli in the acceptability judgment task and the reading time experiment in chapters 3 and 0. The corpus study provides further evidence for the fact that V3 is rooted in the German language and is not the result of a multilingual environment.

2.1 Evidence against production errors and ASVO as sources of V3

At first sight, one could argue that V3 sentences are instances of errors in language production. After uttering the adverbial, the speaker might simply restructure or correct the sentences they started producing. V3 could also be an instance of ASVO, a well-known pattern from language learning. Thus, one might wonder why examining V3 sentences in more detail is relevant and how the analysis of the sentences contributes to linguistic research. Even though V3 might superficially appear to be the result of a speech error or ASVO in language learners, there is ample evidence that V3 has an entirely different status than those two phenomena. These different statuses make Adv-S-V_{fin} a highly interesting research topic.

Let us examine both possibilities and determine what argues against V3 as a production error or ASVO. If V3 is the consequence of a speech error, then it should exhibit the same linguistic properties as any other type of self-correction. However, this is not the case. In self-initiated self-corrections, the speaker recognizes problems after starting an utterance, which requires

restructuring the sentence that is uttered (cf. Peiffer 2010: 184). There are several strategies for solving problems in sentence production, most notably replacement, completion, or deletion of the problematic part of the utterance (cf. Pfeiffer 2010: 184). If V3 involves grammatical problem solving, the segment that the speaker needs to repair in order to maintain V2 is the adverbial after it has been uttered. Hence, it is an instance of post-positioned repair (cf. Schegloff 1979: 273). Pfeiffer (2015: 53) differentiates the group of post-positioned repairs in correction and elaboration, the former modifying errors in production, and the latter providing more information and alternatives in order to specify the utterance. Since it is rather unlikely that subjects are used to specify the given elements preceding the subject, V3 could rather be treated a correction. Furthermore, Peiffer (2015: 54) distinguishes between phonological, syntactic, semantic, and pragmatic repairs, which refer to the "relation of the original utterance and repair"[5]. V3 might be an instance of syntactic correction because, in syntactic corrections, the speaker adds a constituent that has been forgotten and thus changes the linear order of the constituents (cf. Pfeiffer 2015: 57). Example (14) illustrates this kind of repair:

(14)

```
01 P23:  dass sie wIssen dass ich damit !KEIN!,
02       °hh nich irgendwie SAG- (.)
03       ja lEute mir geht_s jetz SCHLECHT;
04       und jetz KÜMmert mal um* äh: eu' (--) euch um mich-
```

(Pfeiffer 2015: 57)

The verb *kümmern* ('to take care') selects a reflexive pronoun which the speaker does not utter before starting the prepositional objects, that is equally required by the verb. The speaker notices this error and marks the problematic segment with the marker *äh,* then interrupts at the beginning of the utterance of the reflexive pronoun. The speaker then inserts a break and utters the reflexive pronoun. While in (14) the reparandum consists in a linearization problem of the constituents, in (15)(16), what is repaired is the syntactic relation between different constituents (cf. Pfeiffer 2015: 58)

(15)

```
01 Tja: äh von DIR [weiss ich ] sIcher;=
02 Tms: [da braucht']
03 Tja: =und von:: MAnu weiss ich sI[cher.]
04 Tms: [ja AL]so.
05       1.8)
06 Tja: mmh: (.) ich werd svEn auch noch mal dirEkt
        drauf FRAgen;* (-)
07      drauf ANsprechen; (-)
08 Tms: ach (-) meinst_de,
```

[5] Orig.: "Diese Einteilung ergibt sich – genau wie die Unterscheidung von Korrektur und Elaborierung – aus dem Verhältnis von ursprünglicher Äußerung und Reparaturdurchführung." (Pfeiffer 2015: 54, transl. OB).

09 <<all> würd ich NICH machen;> (Pfeiffer 2015: 58)

In line 06, Tja chooses the wrong verb in the expression *jemanden auf etwas ansprechen* ('so call sb. on sth') Instead, the speaker utters the verb *fragen,* which usually does not co-occur with the preposition *auf*. She resumes the utterance, repeating the prepositional adverb *drauf* and utters the more canonical verb *ansprechen*.

In V3 sentences, there is no evidence that the speaker identifies the preverbal structure as an error. Initial adverbials are not themselves false starts in a syntactical sense since nothing prevents the speaker from continuing with the finite verb after having uttering adverbial. The speaker would classify the adverbial as a false start when uttering the subject. Hence, the subject would have to be repaired. However, V3 sentences show no signs of a repair mechanism to the subject. Generally, V3 lacks several properties that are reported for repair structures. Table 1 summarizes these properties:

obligatory	**facultative**
Syntactically incomplete structure	Marking of the interruption (particles, breaks, etc.)
Break in the turn	Reproduction of the original utterance
Replacement of the reparandum	

Table 1: Properties of self-initiated self-corrections (Di Venanzio 2016: 10).

According to Uhmann (2006), the interruption is mandatorily marked with a particle or a pause, but several studies indicate that this is not necessarily the case in German (cf. Hoffman 1991, Wijk & Kempen 1987, Di Venanzio 2010). It is unclear why the initial adverbial should be a syntactically incomplete structure because, as I will further illustrate in section 2.3, V3 does not necessarily exhibit breaks between the preverbal elements. In fact, the dissertation focuses on V3 without breaks between and after the initial constituents. In addition, the initial adverbial has a particular function, as will be shown in more detail below, namely, that of a frame-setter[6] or a discourse linker. The adverbial puts the following utterance into context, making it unlikely that there is an incomplete structure present that is corrected in the following utterance. Rather, the adverbial maintains its function as a frame-setting or discourse linking element. However, as already indicated, there are instances of corrections where pauses and particles are missing. This is the case when the speaker wants to signal turn-keeping (Hoffmann 1991: 103) in order to prevent the interlocutor from taking the turn. In V3 structures, however, the specific function of the initial element argues against a speech error, and thus, the speaker does not need to avoid pauses and particles in order to maintain the turn.

[6] Alternative terms referring to the same concept are "Chinese style topic" (Chafe 1976), "Scene-setting topic" (Lambrecht 1994).

Treating V3 as speech errors is also not compatible with Levelt's (1983, 1989) production theory of monitoring. Levelt (1983) shows that the speech flow is immediately interrupted once the speaker detects trouble ("Main Interruption Rule", cf. Nooteboom 1980). This is not the case in V3 structures where the speech is not interrupted.

In addition to correcting grammatical flaws in speech, Pfeiffer (2015: 59) states that syntactic corrections signal that the speaker is aware of social norms, i.e., they self-correct if they violate these norms, even though there is no threat concerning sentence comprehension. In other words, syntactic corrections fulfill social functions (Pfeiffer 2015: 59). Indicating the awareness of a specific norm requires that the speaker signals the speech error; in V3, this would concern the two preverbal elements. As mentioned above, there is no sign of signaling the error due to social norms. Conversely, there is evidence that V3 is restricted to informal language. Hence, it is used systematically to mark register differences. In summary, there is evidence that V3 is not the result of a speech error, but instead fulfills a specific function in German.

What about V3 as an instance of ASVO in language learners? Trivially, the fact that L1 speakers of German use V3 in the form of Adv-S-V_{fin} while they do not use ASVO illustrates that Adv-S-V_{fin} and ASVO have different statuses in German. ASVO is well-known in second language acquisition and it resembles V3 structures to some degree, at least superficially. Learners of German produce sentences that place an adverbial before the subject, which precedes the verb. However, in contrast to V3, these are ASVO structures that do not exhibit a verbal bracket and they occur predominantly at a specific stage in syntax acquisition (cf. Clahsen & Muysken 1986, Diehl et al. 2000, Haberzettl 2005, Meisel 2013, Czinglar 2017).

Nevertheless, there are differences in the acquisition of the verbal bracket in early and late language acquisition. While in late acquisition, ASVO is attested frequently, early learners acquire the sentence bracket easily. Thoma & Tracy (2006) and Tracy & Thoma (2009) investigated children with L1 Turkish (Thoma & Tracy 2006), Arabic, and Russian (Tracy & Thoma 2009) and found the following: As opposed to adult L2 learners, early learners of German consistently mark the verb for finiteness in V2 contexts very early, indicating the acquisition of the verbal bracket. The acquisition of finiteness and word order in early L2 learners did not differ from monolingual L1 learners of German, but the children differed in terms of speed of the acquisition of the sentence bracket. Overall, early L2 learners outperformed L1 learners in terms of speed in the acquisition of the sentence bracket. The study showed no effect of the L1 of children.

However, some researchers stress that multilingual speakers in particular display V2 deviations with the verb in the third position. It is thus being argued that multilingualism

triggers these orders (cf. Auer 2003). On the surface, ASVO in L2 learners and Adv-S-V_{fin} in L1 speakers seem very much alike and Auer (2003: 259) argues that Adv-S-V_{fin} in multilingual speakers is the result of restructuring XV into SVO. Thus, Adv-S-V_{fin} and ASVO are treated as the same structure that emerges in language contact situations. However, since ASVO in learners does not exhibit the verb bracket, V3 is not present and therefore not noteworthy in these cases. Adv-S-V_{fin}, conversely, does have an intact verb bracket. Hence, it is an instance of real V3 that occurs in both monolingual and multilingual speakers. In addition, V3 orders do also appear in the acquisition of German as the only L1 (cf. Tracy 1991, Fritzenschaft et al. 1990).

In sum, there is evidence that V3 is neither a speech error nor ASVO known from language acquisition. Instead, there is evidence that the structure is indeed rooted in German. Diachronic data further support this fact. V3 already occurs in Middle Low German (Petrova 2012), and Early New High German (Speyer 2008), as illustrated in (16) and (17):

(16) Middle Low German (Petrova, 2012: 33)
[Nicht langhe darna] [der sone] volghete na vor ludeke.

(17) Early New High German (Speyer, 2008: 479)
[Jm 6886. Jar] [der Großfuerst DEMETRI] hat den maechtigen Tatarischen Khuenig MAMAI geschlagen.

The pattern resembles V3 in modern German and fulfills the same functions. Axel (2007: 248) states that XP-pron-V_{fin} were "native" and "partially productive in earlier OHG". Furthermore, Axel (2015: 17) notes that "we still find a certain amount of V3 order in the 8th and 9th-century prose texts, most notably with personal pronouns and with certain adverbials". Two instances of the structures in OHG are provided in (18) and (19)[7]:

(18) Thanne se zéllent thuruh mih al úbil
Dann er/sie/es erzählen/verkünde/berichten durch ich all Übel/Böses
anan íuih[8]
gegen/über ihr [Otfrid_1.1 > O_Otfr.Ev.2.16]

(19) Tánne síe gesâhîn daz hêrote síh sámenon ín daz
Danach er/sie/es sehen daß Senat sich versammeln in der/die/das
sprâch-hûs
Gerichsgebäude/Rathaus[9]
[DDD-AD-Z-Notker-Martianus_Capella_1.1 > N_Mart_Cap.I.55-59]

[7] Query used: pos="ADV" . pos="PPER" . pos="VVFIN".
[8] https://korpling.org/annis3/?id=b5f21204-128b-4b47-a62f-c35fe85f3aad <2020-4-1>
[9] https://korpling.org/annis3/?id=1d6a0f52-e9a3-4b80-86c7-f1ffd3976a2b <2020-4-1>

Pronouns play a crucial role in older Germanic because they generally trigger V3 (cf. van Kemenade 1987 for old English, Axel 2007 for OHG). On the other hand, Westergaard (2005) states that information structure gives rise to V2 and V3 orders, indicating that the status of the subject (pronoun or DP) is not the (only) driving factor. If the subject conveys new information, V2 emerges, but if the subject conveys given information, V3 occurs. As we will see below, this is in line with V3 in contemporary German, where the topical subject is an aboutness or familiar topic in the sense of Frascarelli & Hinterhölzl (2007: 88).

To summarize, V3 is attested in Old Germanic, especially Old English, Old High German, Middle Low German, and Early New High German. Wiese & Müller (2017: 16) highlight that some researchers assume that V2 is "fully generalized in Old High German", which is why V3 is supposed to become lost. This, however, does not seem to be the case. In fact, V3 seems to have survived through Old High German, Middle Low German, and Early New High German until today. This indicates that V3 is entrenched as an option for declaratives in Germanic, which comes with specific functional and grammatical properties.

In this section, I provided evidence for what V3 is not: It is not an instance of a speech error nor ASVO. Instead, it is a structure that has been present in the German language for centuries and is still used today. Given the strong V2 preference in German, it is therefore interesting to investigate the status of V3. After having examined what V3 is not, we now turn to the status of V3 from the perspective of language use.

2.2 V3 in multilingual and monolingual settings

Kiezdeutsch is spoken in urban areas in Germany with a high level of linguistic diversity, such as Kreuzberg, Neukölln, or Wedding in Berlin (cf. Wiese 2006). Here, the major languages in contact with German are Turkish, Arabic, and Kurdish. However, there are many other languages spoken in these areas. As a consequence, the linguistic variety emerging here is due to a generally highly diverse linguistic context and cannot be attributed to the influence of a specific language. Wiese (2009: 783) points out that in these highly diverse urban contexts, the circumstances of language acquisition are similarly diverse. While some children grow up with German at home, in Kindergarten, and at school, others speak the heritage language of their parents at home, with friends or neighbors. Moreover, some Kiezdeutsch speakers are familiar with "the German of first-generation immigrants" (cf. Wiese & Rehbein 2016: 57). This linguistic diversity contributes to the emergence of multiethnolects that are in turn characterized by grammatical innovations (cf. Wiese 2009: 783), such as transfer of linguistic material from

other languages (cf. (20)), bare NPs without prepositions or determiners (21), pragmatically supported light verb constructions (22), and word order deviations (23):

(20) Warum lügst du, lan? [KiDKo v2.0, MuH13MT]
(21) a. wir gehn jetzt FANmeile (Wiese 2013: 225)
b. hastu U-bahn? – nee, ich hab FAHRrad (Wiese 2013:210)
(22) macht ihr GLEISCH farbe (Wiese & Rehbein 2016: 54)
(23) a. brauchst du VIER alter (Wiese 2013: 231)
b. dann die sind zur Ubahn gerannt (Wiese 2013: 232)

Wiese & Rehbein (2016) provide an in-depth look into the occurrence and structure of V3 illustrated in (23) in the KiezDeutsch-Korpus.[10] They find that, in the multilingual main corpus, only 0.65% of all declaratives are V3 declaratives ($n_{declaratives}$ = 19,324, $n_{V3\ declaratives}$=126). In the complementary monolingual subcorpus, V3 declaratives are less frequent: only 0.02% ($n_{declaratives}$ = 8065, $n_{V3\ declaratives}$=2) of the declaratives were V3. Walkden (2017: 65) finds 16 V3-clauses in a total of 8945 main clauses (0.2%) in the monoethnic subcorpus, while there are 159 V3 declaratives in 23,506 main clauses (0.7%) in the multiethnic subcorpus. He reports that this finding is statistically "clearly significant". The numerical differences between the two studies might be due to different versions of the KiezDeutsch-Korpus. In both cases, the number of V3 declaratives is small, but it is higher in Kiezdeutsch speakers than in monolinguals.

V3 has been reported to occur across different speaker groups in different communicative settings. Pohle & Schumann (2014) observe a relation between V3 and informal language in Kiezdeutsch speakers, and Wiese (2013), Wiese & Müller (2017), and Schalowski (2017) find V3 in monolingual adult speakers in semi-informal contexts, e.g., in discussions after presentations at conferences:

(24) a. im Gehirn das Sprachverstehen ist wechselseitig organisiert [BSa-Sch3]
b. in der AUSsprache du wirst trotzdem stigmatisiert [Fieldnotes, H.W.]

However, V3 also occurs in clearly informal contexts:

(25) In Bielefeld sind die Leute immer schon so grumpy. Aber in Süddeutschland die Leute waren so freundlich. [BSa-B, 19]
(26) Oh gestern aufm Schulhof ich wollte n Apfel essen... keine Chance! [BSa-B, 25]
(27) Du musst ja deine Lohnsteuerkarte abgeben. Also von daher die wissen das schon alles. [BSa-B, 15]

Numerous examples can also be found in mass media such as radio and television:

[10] The Kiezdeutschkorpus comprises spoken, spontaneous speech in peer groups of adolescents. The informants were asked to make self-recordings in their everyday life with peers. Hence, the data are authentic and reflect natural language use. The corpus consists of the main and the complementary corpus. The main corpus contains Kiezdeutsch speakers in Berlin-Kreuzberg and approx. 228,000 tokens. The complementary corpus consists of adolescents in Berlin-Hellersdorf, an area with predominantly monolingual speakers. It consists of 105,000 tokens.

(28) Als wir euch KENNgelernt haben in der Villa du warst so mit der riesen PeRÜcke
[Bill Kaulitz, „Queen of Drags“, 14.11.2019; episode 1; 1:22,53 – 1:24,12]

Tracy & Thoma (2009: 8) state that L1 learners of German “occasionally produce main clauses with the verb in third, not second, position with adverbials like *dann*” (also see Tracy 1991). This, according to the authors, is not surprising, since the edges of the German clause are “fuzzy”. German systematically displays multiple elements in the left and the right periphery, e.g., when main clauses occur with connectors to their left (*und*, *oder*, *denn*, *sondern*) or when heavy constituents or relative clauses are extraposed to the right. In addition to the observation made by Tracy & Thoma (2009), V3 is not bound to specific lexical items such as *dann*. However, as we will see below, *dann* certainly plays a very specific role in the left periphery in general. Still, the “fuzziness” of the sentence peripheries needs to be kept in mind when analyzing V3, but it could also be acknowledged as a possible resource for variation. Perhaps a closer inspection of grammatical and functional properties, as well as the processing of the peripheries can help to unravel the fuzziness. Below, I will explain the grammar and function of V3 in detail, simultaneously taking into consideration relevant aspects concerning the left periphery in German.

Before turning to this aspect, however, we might ask why V3 occurs in the first place if German has a robust V2 preference in declaratives. For one, V3 might be preferred from a cognitive perspective. Referring to Abraham (2006), Wiese (2013: 27, footnote 54) points out that the parser prefers V3 over V2 in online sentence comprehension, since V3 facilitates discourse organization. More evidence for a “psychological reality” (Wiese & Müller 2017: 15) of V3 comes from two studies presented in Wiese et al. (2017a, b). In the studies, participants with different L1s (English, German, Turkish) and Kiezdeutsch speakers were asked to act out the last picture of a three-picture comic strip, using 1) language and 2) toys and verb cards. As expected, influence from the respective languages occurred in the linguistic condition, but in the extra-grammatical condition, there was a strong tendency for a specific information-structural ordering of the events in all languages, namely the FRAME-SETTER >> TOPIC >> FINITE VERB order. Therefore, cross-linguistically, V3 appears to provide a better word order option from a cognitive perspective, overriding the V2 preference in V2 languages such as German. Two constituents that usually compete for the initial position can be placed there simultaneously. Additionally, Schalowski (2017: 21) suggests that “a reason for the weakening of V2 in spoken German [is] the interactive and time-constrained character of spoken language.”

Apart from cognitive and communicative reasons, several studies show that V3 in Kiezdeutsch and other multiethnic varieties, exhibits linguistic properties on various levels, i.e., prosody, syntax, and information structure (see Wiese 2009, Wiese et al. 2012, Schalowski 2015, Freywald et al. 2015, Wiese & Müller 2018, Alexiadou & Lohndal 2018). Hence, it seems reasonable to assume that all these factors contribute to word order variation in the preverbal area, leading to V3. The next section deals with these properties of V3.

2.3 Prosodic properties

There is comparatively little research on the prosody of V3 sentences. However, Schalowski (2017), te Velde (2016), and Freywald et al. (2015) provide a promising starting point for further investigation. The initial element in V3 structures is integrated into the main clause prosodically, i.e., in most cases, the adverbial does not bear main stress, and a progredient intonation follows the adverbial. However, instances of rising and falling intonation also occur. In contrast, Kern & Selting (2006) discuss sentences in which the temporal adverbials can be pre-positioned in front of a V2 clause, bearing primary stress and being prosodically separated from the rest of the clause. They identify three structures with preposed adverbials, all of which have specific prosodic and functional properties and form a continuum of prosodically exposed and prosodically integrated structures. Table 2 summarizes the findings concerning the prosody and function of preposed adverbials.

	Preposed adverbial type	**Prosodic form**	**Discourse function**
↑	prosodically exposed	• main accent • end of the intonation contour • pause between preposed element and following syntagma • final semi-rising intonation • sudden change in tone pitch (downstep)	• focus • gain the hearer's attention
	prosodically cliticized	• secondary accent • connected to the following syntagma through latching • final semi-falling intonation • sudden change in tone pitch (downstep)	• focus • guiding the attention back to a preceding subsequence • ending a subsequence
↓	prosodically integrated	• accent • intonational contour without prosodic break or pause	• focus

Table 2: Types of preverbal adverbials, according to Kern & Selting (2006).

The main function of preposed adverbials is creating focus, gaining attention, and structuring the discourse. V3 does not fit into this continuum and it has fundamentally different prosodic properties. The initial adverbial is not separated from the subject pronoun with a pause and neither of the constituents bears pitch accent. The prosodic features are visualized in the following graphic (Bunk 2016: 24).

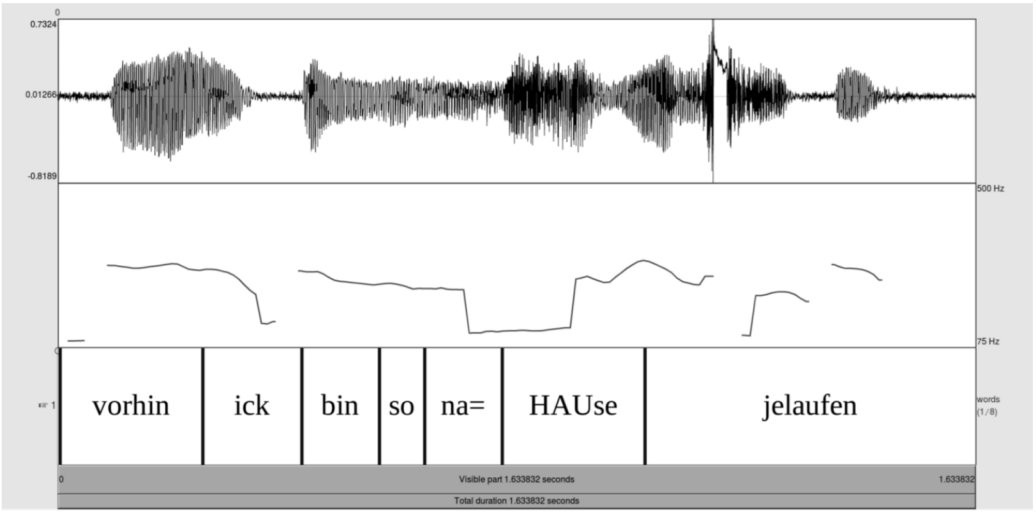


Figure 2: Prosodic realization of and V3 sentence.

The illustration shows no indication of a prosodic separation of the initial adverbial: There is no break, nor does the adverbial bear main stress. Also, the initial element does not have its own prosodic contour. V3 resembles sentences with initial prosodically integrated adverbials in Kern & Selting (2006), but their function is not to assign focus. Instead, they either link discourse units or function as frame-setters for the following utterance. Neither the discourse linking nor the frame-setting function of the initial adverbial is represented in Kern & Selting's (2006) overview. Thus, V3 has a different status than the structures presented in Kern & Selting (2006).

2.4 Grammatical properties

The preverbal area concerns material that precedes the finite verb in declaratives, hence, the area that is also referred to as the *prefield*. The term was introduced by Erich Drach (1937) as a component of the topological field model. The model was later critically discussed and further developed, most notably by Reis (1980) and Höhle (1986). The most widely used version of the field model consists of the prefield, left sentence bracket, middlefield, right sentence bracket, and postfield. Not all fields have to be filled with linguistic material in all contexts, which gives rise to three options in terms of verb placement in German: V1 (verb first), V2 (verb second), and VL (verb last).

	Prefield	**Left sentence bracket**	**Middlefield**	**Right sentence bracket**	**Postfield**
V2	Das Kind	hat	ein Eis	gegessen	als es auf dem Weg zur Schule war.
	Was	hat	das Kind	gegessen	als es auf dem Weg zur Schule war?
V1		Hat	das Kind ein Eis	gegessen?	
		Iss	ein Eis!		
VL		als	es auf dem Weg zur Schule	war	

Table 3: Topological fields in German.

Even though V2 is often considered to be prototypical for a declarative clause, there is no one-to-one relation between verb placement and sentence type. There are, for example, V1 declaratives (cf. Önnerfors 1997), and imperatives and exclamatives can both exhibit V1, V2, and VL (cf. Freywald 2018 for a discussion concerning form and function in terms of verb placement). From a V2 perspective on German, if there is more than one constituent that potentially could be placed in the prefield, those constituents compete for the initial position. However, this is not the case in V3 structures. In the preverbal area in Kiezdeutsch, Wiese & Rehbein (2016: 57) find a strong tendency towards ADVERBIAL >> SUBJECT order, with 90% of all V3 displaying this pattern. In 92%, the first element was an adverbial; in 94%, the second element was a subject; and in 72% of the V3 cases, the topic was a pronominal DP, and the adverbial was temporal.

Wiese & Müller (2017) investigate the frequency of initial adverbials in V2 and V3 in Kiezdeutsch and monolingual German and find that V3 contains significantly more initial adverbials in comparison to V2 sentences. *Dann* ('then') and *danach* ('afterwards') appear most frequently, occurring in the initial position in 28% of all V3, but only in 2% of all V2 declaratives. Additionally, *dann* occurs significantly more frequently in V3 initial position than in V2 initial position in Kiezdeutsch speakers; but in general, *dann* does not appear significantly more frequently in multilinguals than in monolinguals. However, the initial adverbial in V3 sentences is not restricted to a specific semantic class (Schalowski 2015). It can appear as a temporal, local, causal, conditional, and modal adverbial, but temporal adverbials occur most frequently in Kiezdeutsch (cf. Wiese & Rehbein 2016: 57). The adverbial can appear in different syntactic categories: It can be an adverbial phrase (AdvP), a determiner phrase (DP), a prepositional phrase (PP), or a complementizer phrase (CP). The examples in (29) illustrates the different semantic classes and syntactic categories (examples all adopted from Schalowski 2017: 15-16):

(29) a. [jetzt] [ich] wollte Sie treffen (…) *temporal AdvP*
b. [Jedes Jahr] [ich] kauf mir bei Deichmann. *temporal DP*
c. [In der Mitte des Zuges (…)] [Sie] können sie gerne benutzen. *Local PP*
d. [Weil ich frech war], [sie] hat mich zur Tafel geholt. *causal CP*
e. [Wenn der Mann das hört] [er] wird sagen (…) *Conditional CP*
f. [Eventuell] [beim Verumfokus] kann das vorkommen. *Modal AdvP*

The examples further illustrate that the initial element can be light or heavy in its phonological weight. te Velde (2016) states that in Kiezdeutsch, phonologically light adverbs are preferred. Samo (2018) distinguishes different patterns of V3 in Kiezdeutsch that once again illustrate the broad variety of the initial adverbials.

(30) Temporal Adverb - Subject - Verb
a. $\text{TEMPORAL}_{\text{ADV}}$ – $\text{SUBJECT}_{\text{DP}}$ – LEX_{VERB}
Jetzt der Friesi kommt
b. $\text{TEMPORAL}_{\text{ADV}}$ – $\text{SUBJECT}_{\text{DP}}$ – AUX_{PAST}
heute der tag ist für mich so schnell vorbeigegangen
c. $\text{TEMPORAL}_{\text{ADV}}$ – $\text{SUBJECTP}_{\text{RO}}$ – LEX_{VERB}
Jedes jahr ich kauf mir bei DEICHmann
(31) Temporal PP - Subject - Verb
ab JETZ ich krieg immer ZWANzig euro
(32) Temporal CP - Subject - Verb
Wenn der mann dis HÖRT er wird sagen …
(33) Locative Adverb - Subject - Verb
Hier ich habe UNINTERPRETABLE gesehen (Samo 2018: 174 – 179)

The examples also show that the immediate preverbal constituent is much more restricted in its form than the adverbial. The constituent is, in almost all cases, the pronominal subject of the clause. In the main corpus of the KiezDeutsch-Korpus, Wiese & Rehbein (2016: 57) find that in 93% of the V3 cases, the referent is a human being. Other arguments are not allowed in the preverbal area (cf. Freywald et al. 2015), but they may appear in the postverbal region.

Samo (2018) argues that examples (30) – (33) are ungrammatical in standard German. This widespread view on V3 suggests that Kiezdeutsch and monolingual German differ in their structural makeup concerning the prefield, with Kiezdeutsch allowing for V3 while standard German does not. However, it might be the case that the German prefield generally exhibits properties that potentially allow for V3 regardless of a particular variety. Given the fact that V3 also occurs in monolingual German, this is indeed highly likely.

This brings us to the similarities and differences of the preverbal area in V3 and V2 declaratives. Shedding light on this aspect can give valuable insights into the status of V3 and it might indicate what triggers V3 in the first place. The preverbal constituent in V2 declaratives is a constituent that can either be short (i.e., a simple DP) or long (i.e., it consists of many

components that form a more complex unit). Hentschel & Weydt (2013: 390) mention that the number of lexical items that can appear in the prefield is potentially unlimited, but in actual language use, the number is limited due to human memory capacity. Thus, the prefield can consist of relative clauses, attributes, or subordinate clauses. In Hoberg's (1981: 156) corpus analysis[11], 87.14% of all the prefields consist of exactly one constituent, which, as she concludes, supports the claim that declaratives with one preverbal element state the standard case for German declaratives. However, in her data, 11.02% of the prefields host two constituents.

In many studies concerning the first position in V2 declaratives subjects, adverbials, and objects are reported to occur in the initial position. Examples are given in (34).

(34) a. Dörte repariert zuerst den Kondensator.
b. Den Kondensator repariert Dörte zuerst.
c. Zuerst repariert Dörte den Kondensator.

These elements can occur as clauses or small lexical units, and they can be modified, e.g., by relative clauses. In addition, the prefield can host several elements that are part of a constituent, namely predicatives (35), non-finite main verbs that belong to the verbal complex (36), infinite verbs that appear together with their complements (37), PPs of light verb constructions (38), parts of the predicate (39), prepositional attributes (non-CPs) that are separated from their antecedent (40), expletive and topical *es* ('it') (41), and thematic unmarked and unaccented *so* ('so') and *da* ('there') (42):

(35) Groß ist Karl nicht. (Wöllstein 2010: 39)
(36) Begonnen hatte Vogel seine berufliche Laufbahn bei Bertelsmann. (Altmann & Hofmann 2004: 83 – 93)
(37) Dem Kind einen Ball schenken wollte ich eigentlich nicht. (Altmann & Hofmann 2004: 83 – 93)
(38) Zur Aufführung kommt die Missa brevis in G-Dur von J. (Altmann & Hofmann 2004: 83 – 93)
(39) Auf fällt, dass er immer so spät kommt. (Dürscheid 2012: 96)
(40) Von Chomsky habe ich das neue Buch gelesen. (Dürscheid 2012: 95)
(41) a. Es regnet.
b. Es wurde bis tief in die Nacht hinein diskutiert. (Dürscheid 2012: 96)
(42) Es/da/so ritten drei Reiter zum Tor hinaus. (Wöllstein 2010: 39)

Compared to the initial constituents in V3, the group of elements in the prefield in V2 sentences is much more heterogeneous and the prefield itself is less restricted in its form. In

[11]Hoberg's (1981) analysis is based on data from the "Mannheimer Corpus", which comprises contemporary written German texts from the year 1945 onwards. The corpus consists of newspapers, magazines, novels, and popular science books and it contains approximately 85,000 words in about 11,000 clauses.

V3, the first constituent must always be an adverbial while the second position is restricted to subjects. Preverbal objects are not attested in V3 sentences. However, even in V2 subjects, adverbials, and objects are not randomly placed in the initial position but are systematically distributed. Several corpus studies show that their distribution depends on several factors such as mode (written vs. spoken), text type (newspaper articles, academic papers, prose), and discourse type (monologues vs. dialogues).

Engel (1974), e.g., conducts a corpus study with spoken and written data and aims to explore the distribution of initial elements in declaratives. The spoken data are transcribed recordings of different registers. They are spontaneous monologues or conversations and include regional and standard oriented language. Moreover, the speakers have various educational and professional backgrounds. The written data are a selection of newspaper articles from the "Süddeutsche Zeitung". Generally, Engel (1974: 90) finds that in spoken monologues (e.g., reports) and in narrative segments in dialogues, initial adverbials are more frequent than subjects. Conversely, in dialogues, subjects are more frequent than adverbials. According to Engel (1974), narratives and monologues require a more complex structuring of the argument that is constructed. In these discourse types, sentences are linked to each other much more than in dialogues, where turns change frequently, and the speaker reacts to the utterances of the interlocutor. Therefore, the speaker makes use of the "neutral" initial subjects in dialogues while placing adverbials at the beginning of a sentence creates textual coherence, which is more important in narratives.

The distribution of the adverbials themselves depends on the adverbial type. Frey (2004) states that some adverbials prefer the initial position more than others, e.g., pragmatic and situational adverbials tend to appear initially while modal adverbials do not. This is in keeping with the findings on V3 sentences. The adverbial is preferably temporal or local and, to a lesser extent, allows for modal adverbials. Corpus studies further support Frey's (2004) observation. Bohnacker & Rosén (2008) conduct a corpus study on informal letters, and they observe a different distribution of initial adverbials depending on the semantic classes. In their study, temporal and local adverbials occur in the initial position in 17%, while other adverbials occur in 25% of the cases. Hoberg (1981) investigates a corpus consisting of written texts with different degrees of formality but with a predominantly formal character (belletristic literature, popular science literature, memoirs, newspapers, and journals). She finds that the chance for adverbials to appear in the initial position is higher for specific semantic adverbial types. Pragmatic and situational adverbials tend to appear in the prefield more often than modal adverbials.

Engel (1974) finds that objects are less frequent than adverbials and subjects, and they occur more frequently in spoken than in written texts. Engel explains this difference in the following way: Initial objects reflect a more emotional style of speaking, which is more evident in everyday spoken language. In spoken language, prosody is a very prominent cue that signals different discourse statuses of the entities involved in discourse. Initial objects always have stress and function as contrastive topics (Féry 2008), and hence the contrastive function of the topic is supported by prosody. As opposed to initial objects, initial subjects and adverbials do not necessarily have to possess this contrastive function, and hence they do not have to bear stress. However, adverbials can function as contrastive topics (cf. Laenzelinger 2004: 238), while subjects can either be continuing topics, aboutness topics, or contrastive topics.

Subjects are often considered to be unmarked constituents in the prefield, as opposed to initial objects and adverbials, and many studies report that they occur most frequently in the prefield of V2 declaratives (cf. Bohnacker & Rosén 2008). However, one might wonder whether constituents appear sentence initially more often because they are generally more frequent. Hoberg (1981) takes this factor into account when investigating the initial constituent in declaratives. She shows that subjects are most frequent in the initial position and constitute roughly 63% of the prefields. At the same time, over half of the sentences that had a filled prefield displayed the subject in another field, meaning that overall, subjects are generally widespread, not only in the prefield. Hoberg argues that the preference of the linear order of elements in the middlefield correlates with the likelihood of an element to appear in the initial position. In other words, the more an element tends to appear at the left edge of the middlefield, the more likely it is that this element appears in the prefield. Subjects occur at the beginning of the middlefield (see also Frey 2004b, who argues for a base position of topics in the left edge of the middlefield), and thus they are frequent in the prefield. However, when considering the information-structural properties of the preverbal elements, Speyer (2010) provides evidence that scene-setters are more frequent than topics. I will come back to this point in more detail in section 2.5.

The studies show that the frequency with which elements occur in the initial position depends on factors such as formality, text type, and discourse type. Tentatively, objects are less frequent than subjects and adverbials. Adverbials, on the other hand, favor the initial position, especially in narratives and when they have a special pragmatic function. Temporal and local adverbials appear to be particularly indicative of this purpose. Taking these findings into account, V3 appears to be a logical consequence in cases where V2 is, for whatever reason, abrogated. Subjects and adverbials, the two most frequent constituents in the prefield, frequently compete

for the initial position in V2 sentences but in V3 they are placed adjacently in the preverbal area violating V2. However, for particular reasons, ADVERBIAL >> OBJECT orders are unattested. This option might be excluded due to information-structural reasons, as the next section illustrates. The following section focuses on the general definition of information structure and the relationship between frame-setters and topics since these concepts are essential for the analysis of V3 sentences.

2.5 The role of information structure

V3 has specific information-structural properties that point to an "interplay of grammar and pragmatics" (Wiese 2009: 787). While the initial adverbial functions as a frame-setter or discourse linker, the subject is the topic of the clause (Wiese 2009). Wiese & Rehbein (2016) find that in Kiezdeutsch in 94% of the information-structurally unambiguous V3, adverbial and subject correspond to frame-setter and topic, respectively. This strongly suggests that information structure (henceforth IS) is heavily involved in word order variation in German, particularly with respect to preverbal variation.

In the literature, there are various definitions of IS. Generally, IS is understood to refer to the presentation of information in a particular communicative context and with reference to specific beliefs and assumptions towards the interlocutor's knowledge in the current situation. The concept of IS is described by Halliday (1967: 200) and is understood as the distribution of information units. Halliday (1967: 200) states that IS does not *depend* on the constituent structure, but instead, it *specifies* the constituent structure. It contributes to the thematic organization of the discourse, which is reflected in word order[12]. According to Vallduví & Engdahl (1996: 460), IS, which they call "information packaging", refers to "a structuring of sentences by syntactic, prosodic, or morphological means that arises from the need to meet the communicative demands of a particular context or discourse". Along these lines, Chafe (1976: 54) observes that nouns can "occupy various 'packaging' statuses selected by the speaker based on his assessment of what the addressee's mind is capable of at the time". These statuses are *given/new*, *focus of contrast*, *definite/indefinite*, *subject*, *topic*, and *reference*. In recent approaches, Chafe's (1976) "subject" and "topic" are renamed "topic" and "frame-setter" respectively.

Topic-comment is one of the key concepts in information structure in addition to *given-new*, *focus*, and *contrast*. Krifka & Musan (2012: 25) state that the concept of topichood goes back

[12] Apart from word order, prosody plays a major role in information structure. However, within the scope of this dissertation, the prosodic properties of IS will not be examined. For the relationship between prosody and IS, see, among many others, Grundel (1999), Büring (2010), Drubig (2003), Féry (2007).

to Aristotle (384 BC – 322 BC). In his understanding, the subject (=topic) is the entity about which the predicate makes a statement. In comparatively more recent approaches on topichood and subjecthood, von der Gabelentz (1869) introduces the concepts "psychological subject" and "psychological predicate". The psychological subject is the entity that the speaker "wants the hearer to think about" (Krifka & Musan 2012: 26)[13]. Krifka & Musan (2012: 28) define topics in the following way:

> The topic constituent identifies the entity or set of entities under which the information expressed in the comment constituent should be stored in the common ground content.

The authors compare this definition to a file card system: Just like information in a file card system is associated with file cards, new information is not added in the form of unstructured propositions but is preferably associated with certain entities (cf. Krifka & Musan 2012: 27). Krifka & Musan (2012: 28) illustrate this using the following example:

(43) a._[Aristotle Onassis]$_{\text{Topic}}$ [married Jacqueline Kennedy]$_{\text{Comment}}$.
b._[Jacqueline Kennedy]$_{\text{Topic}}$ [married Aristotle Onasses]$_{\text{Comment}}$.

In (43), the listener stores the information as information about Aristotle Onassis; meanwhile, in (43), the information of the same proposition should be stored as information about Jacqueline Kennedy. The common ground is the "information that is mutually known to be shared in communication" (Krifka & Musan 2012: 1).

In V3, the adverbial might function as a file card. It sets a temporal or local frame that operates on the proposition or the structure of the discourse. In other words, it "sets the frame in which the subsequent comment about the topic in the X-slot has to be interpreted" (Schalowski 2017: 20-21). Information that follows the initial adverbial is to be interpreted against the temporal or local background provided by the speaker. However, according to Musan & Krifka (2012), frame-setters do not constitute a file card, nor do they function as topics, as Musan & Krifka (2012: 31) illustrate:

(44) A: How is John?
B: {Healthwise/As for his health}, he is [FINE]$_{\text{F}}$.
(45) A: How is business going for Daimler-Chrysler?
B: [In GERmany]$_{\text{Frame}}$ the prospects are [GOOD]$_{\text{F}}$,
but [in AMErica]$_{\text{Frame}}$ they are [losing MOney]$_{\text{F}}$.

In (44), the authors argue, the proposition is not stored under a file card "healthwise" on the common ground, and in (45) the topic is Daimler-Chrysler and not *Germany* or *America*. Thus, frame-setters restrict the context, implying alternatives that are excluded and in which the

[13] Krifka & Musan (2012: 26 – 28) give an extensive overview of the concept topic. I refer the reader to their work for a more detailed discussion.

following expression does not necessarily hold. If one wants to subscribe to the file card metaphor, frame-setters do not constitute file cards in which information is stored; rather, they are the file card box. However, the function of frame-setters is similar to the function of a contrastive topic. Frascarelli & Hinterhölzl (2007: 88) argue for three types of topics that can be distinguished by their distinct functions, phonological and syntactic properties. Example (46) summarizes the functional and phonological features:

(46) a. *aboutness topic*: "what the sentence is about"; in particular, a constituent that is "newly introduced, newly changed or newly returned to" (Givon 1983: 8), a constituent which is proposed as "a matter of standing and current interest or concern"; L+H*[14] contour
b. *contrastive topic*: an element that induces alternatives which have no impact on the focus value and creates oppositional pairs with respect to other topics; L*+H contour
c. *familiar topic*: a given or accessible constituent, which is typically destressed and realized in a pronominal form; when a familiar topic is textually given and d-linked[15] with a pre-established aboutness topic, it is defined as a *continuing topic*; L* contour

Similar to frame-setters, contrastive topics imply alternatives that are excluded by uttering the contrastive topic itself. Should frame-setters and contrastive topics then be subsumed under the same category? Jacobs (2001) states that frame-setters and topics are indeed not clearly separable, and Krifka & Musan (2012) refer to the model of Alternative Semantics, with which it is possible to explain the common core of topic and frame-setter. Krifka & Musan (2012) observe that expressions with a contrastive topic or a frame-setter always have a focus outside of the contrastive element. Thus, they propose the following definition of *Deliminator,* which subsumes both concepts:

(47) A Delimitator α in an expression […α…β_{Focus}…] always comes with a focus within α that generates alternatives α′. It indicates that the current informational needs of the common ground are not wholly satisfied by […α…β_{Focus}…], but would satisfy it by additional expressions of the general form […α′…β'_{Focus}…].
(Krifka & Musan 2012: 33)

The idea is that contrastive topics are uttered because another entity is expected in the current common ground. The same holds for frame-setters, which restrict the context since another context is expected. The definition given in (47) holds for both information-structural concepts while at the same time accounts for unclear cases like (48):

(48) [An [inGEnious] mathematician]$_{\text{Delimitator}}$ he is [NOT]$_{\text{Focus}}$.

[14] L = low tone, H = high tone, * = pitch accent
[15] d-linked = discourse linked

The concept of *Deliminator* might explain why in V3, only specific types of topics are allowed. Schalowski (2017) argues that the subject in V3 is an aboutness topic that has been mentioned in the previous context of the discourse, as (49) illustrates:

(49) a. Preceding context: Ich will nur Latschen, ich schwöre.
b. [*Jedes Jahr*] [*ich*] ***kaufe*** *mir bei Deichmann*.
(KiDKo, transcript Mu9WT, Schalowski 2017: 20)

The topic *ich* that occurs in the preceding context is mentioned in the second position of the sentence in (49b). Thus, it could also qualify as a continuing topic in the sense of Frascarelli & Hinterhölzl (2007: 88). The adverbial *Jedes Jahr* sets the temporal frame that holds for the assertion in (49). Contrastive topics, hence, are not compatible with V3, possibly because two deliminators directly adjacent to each other in the preverbal area evoke problems in interpreting the information. Contrastive topics are also not compatible with the prosodic realization of V3 since the topical element does not bear pitch accent. As I will demonstrate in chapter 5.1, this has severe consequences for the syntactic modeling in the generative framework.

Taking together the aforementioned grammatical properties of V3 and the properties of the German prefield, it appears that several linguistic levels, i.e., syntax, pragmatics, semantics, and information structure, contribute to the emergence of V3 in German. Figure 3 illustrates these links between different linguistic domains.

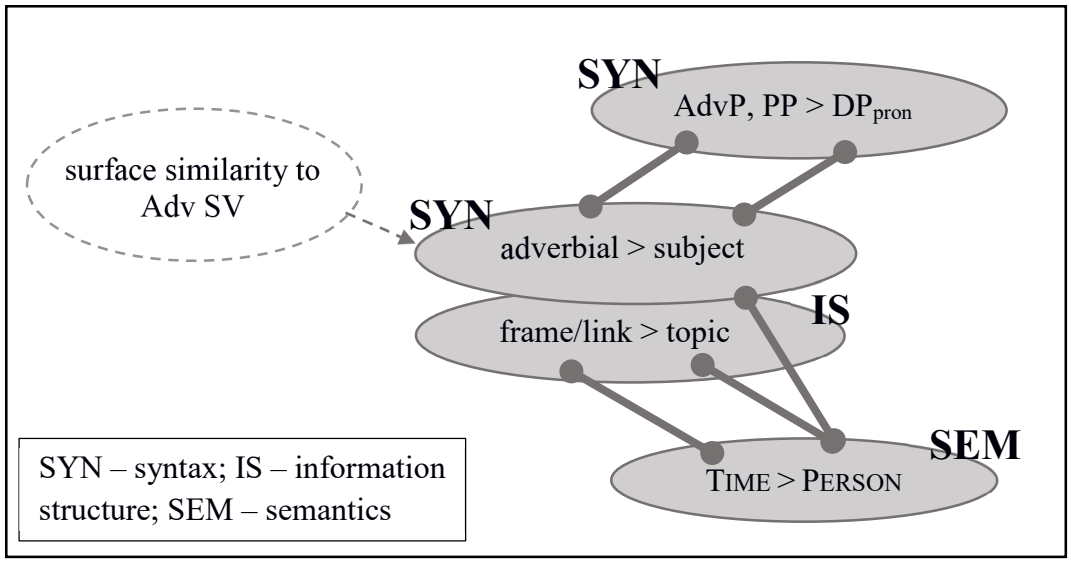


Figure 3: Links between grammatical and pragmatic domains for V3 prefields (Wiese & Rehbein 2016: 58).

All levels illustrated in Figure 3 display the same surface structure, namely, ADVERBIAL >> SUBJECT >> VERB_{FIN}. Thus, this constituent order is supported on various linguistic levels. The figure also illustrates the immediate impact that IS has on word order in V3 sentences.

IS as the driving force behind preverbal word order variation has also been reported for other phenomena (cf. Bassola & Schwinn 2016, Müller et al. 2012, Bildhauer 2011 for apparent multiple prefields; Büring & Hartmann 2001 for focus-sensitive particles in V3; Breindl 2008, Pasch et al. 2003 for connective adverbials in V3; Altmann 1981, Selting 1993, Ebert et al. 2014 for left dislocation constructions; Dewald 2012, Selting 1993 for hanging topic constructions). It seems that the preverbal area is particularly open to variation, and there are several functional reasons as to why this is the case. The prefield can host thematic as well as rhematic constituents. Altmann & Hofmann (2004: 83) state that the prefield functions as the unmarked topic position and Wöllstein-Leisten (2001: 29) claims that the prefield hosts elements that encode already known information. Prototypically, it hosts the theme of the clause (Eroms 2000: 355). More recently, however, the left edge of the middlefield has been argued to be the prototypical position of the topic (Frey 2004b).

Regardless, subject topics tend to appear in the left periphery, which is a phenomenon that can be observed cross-linguistically. Dryer (2005) classifies 1228 languages in terms of word order and finds that 444 (36.16%) have the verb in the second position. The two most frequent word orders have the subject in the initial position. Both SVO and SOV constitute 75.89% of the languages of the world, while only 1% of the languages of the world are object-initial. This distribution points to a general preference for subject-initial sentences in human languages. The occurrence of subjects in the prefield is related to its semantic role rather than its syntactic function. Jackendoff (2002) argues for a general 'agent-first' strategy, which states that the agent is expressed in the subject position in ambiguous sentences, which often coincides with the initial position. The "purely semantically based principle" (Jackendoff 2002: 248) is apparent in different linguistic varieties; it appears in basic varieties (cf. Klein & Perdue 1997), creole, and pidgin languages, as well as in modern languages and to some degree in the language of agrammatic aphasics. Bickerton (1981) refers to this as "topic first", which causes the focus to occur in the final position of a sentence. Jackendoff (2002) states that this principle is a 'fossil principle' from a protolanguage that still is at work in modern languages. The agent-first strategy is a widespread phenomenon in the languages of the world, and seems to be involved in the emergence of V3 as well (cf. Wiese et al. 2009: 8, Wiese 2011: 93).

However, in his corpus study, Speyer (2010) shows that scene-settings elements are more prone to appear in the prefield than topics. In the study, he focuses on the information-structural status of initial constituents and compiles a corpus that includes texts in different modes (spoken and written) and discourse types (monologues and dialogues). The written text corpus consists of "sub-literate prose", i.e., newspaper articles, essays in concert programs, and essays for

readings on the radio. He claims that these texts are of similar "middle stylistic" level. The spoken data are face-to-face conversation recordings in the Swabian dialect. In the written data corpus, 82% of the V2 declaratives prefields that were filled with a referential expression were either topics, contrastive elements, or scene-setters. If these elements appear in the prefield, they do so with the following order of preference:

(50) SCENE-SETTING > CONTRAST > TOPIC

Speyer also investigates how these elements compete with each other when they appear in the same sentence, and finds the same ranking as in (50). In the spoken corpus, Speyer finds two kinds of lexical items that he considers typical for spoken German: *dann* ('then') and subject personal pronouns (SPPs). He distinguishes between dialogical (beginning of turns) and monologic segments (in the body of a discourse segment) and investigates the influence of turn changes in the discourse. He finds different frequencies and rankings among the preverbal constituents in these areas. In more monologic parts of the conversation, the distribution is similar to written texts with specific constraints that are characteristic for spoken language (see (51)) while the distribution is different in a more dialogic segment (see (52)):

(51) Monologic conversation ("Default Ranking"):
DANN, SCENE-SETTING >> SPP >> CONTRAST >> TOPIC
(52) Dialogic conversation ("Ranking at the beginning of turns")
DANN, SPP >> TOPIC >> CONTRAST, SCENE-SETTING

Speyer (2010) suggests that these ratings are due to different demands of the conversational contexts. In monologues, the speaker assumes the overall topic to be present in the discourse universe. Therefore, they can re-introduce the topic as a pronoun in the leftmost position in the middlefield, which is argued to be the archetypical position for topics (see Frey 2004b). At the beginning of the turn in a dialogue, speaker B, who re-introduces the main topic, cannot be sure that it is still present in the discourse universe of speaker A. Therefore, the topic appears as a full phrase and on the right edge of the middlefield, the archetypical position of emphasis and new information. The SPP is established turn-initially in the prefield as the origo, the center around which deictic expressions need to be interpreted. Scene-setters only play a marginal role in dialogs, as opposed to written language and monologues. Here the origo, as well as the main topic, are assumed to be present so they need not be uttered again. In dialogues, the shift of topics might lead to a vague discourse structure, which is why discourse markers, such as *aber* ('but') and *wobei* ('whereas') are used to create coherence.

Speyer's (2010) findings support the assumption that in V3 two constituents compete for the initial position due to information-structural reasons. V3 makes use of general information-

structural preferences of the prefield in placing scene-setters first. Speyer (2007: 84) also states that the German prefield is syntactically underdetermined in the sense that there are no purely syntactic reasons that could explain why elements occur in the prefield. Instead, he argues that information structure plays a significant role in placing the element in the first position. Speyer (2010) also identifies *dann* and subject pronouns as elements that play an important role in the prefield. In monologues as well as dialogues, both tend to appear in this position. Speyer (2010) does not provide an information-structural analysis of those initial elements, but it is noteworthy that it is exactly these elements that frequently occur in V3 sentences. In these sentences, *dann* has been reported to function as a frame-setter or discourse linker, highlighting the discourse-connecting function of the prefield that also is at work in V3 sentences. The following sections shed light on both the frame-setting and discourse-linking functions in V3 structures.

2.6 Frame-setting and discourse-linking V3

Schalowski (2017) argues that the two initial elements *dann* ('then') and *danach* ('afterwards') have a connective function in some cases. According to Engel (1972), connective elements like *dann* do not contribute new information but refer to already introduced entities or concepts because they link the sentence with the preceding context. Preferably, they occur in the form of anaphors (pronouns or adverbs) but also as "full" lexical items if they include subordinate anaphoric elements. Like other discourse markers such as *also* ('well') that occur in V3, *dann* and *danach* seem to develop into discourse markers. However, both elements still retain parts of their original adverbial semantics, which is unusual for initial discourse markers, such as *also*, that become semantically bleached over time (cf. Auer & Günthner 2003). Both *dann* and *danach* explicitly indicate a temporal relationship between two sequences.

(53) Preceding context:
Ich habe gestern gesehen bei Netlog, was sie geschrieben hat. Ich meinte nur so: "Ach so! Dein Ernst?"

[*Danach*] [*sie*] ***fängt****.an zu schreien.*

Intermediate context:
Ich meinte zu ihr: "Schrei nicht so!" und so. "Ja?"
Und [*dann*] [*sie*] ***sagt*** *so*: "Ich schreie so, wie ich will."
(KiDKo, transcript: Mu9WT, Schalowski 2017: 26)

For examples like (53), Schalowski (2017: 26) argues that *dann* and *danach* not only have scope over a single utterance but temporally connect two discourse units. Both connectors guide the hearer "towards discourse and [indicate] temporal relations between discourse units understood as relational propositions" (Schalowski 2017: 26f.). In this way, they directly

constrain the interpretation process. Schalowski states that these connectives are different from frame-setters, in that they do not have a frame-setting interpretation. V3 structures mark the status of *dann* and *danach* as discourse connectives on a syntactic level. *Dann* and *danach* signal "the chronological order of events and subdivide the discourse into smaller, temporally ordered units". Both lexical items are semantically bleached, and other adverbials undertake the function of adding information, which is illustrated in (54). The adverbial *jetzt* occurs in the same sentence as the sentence-initial *dann*, adding temporal information, while *dann* indicates a temporal ordering of two discourse events:

(54) Preceding context: *Also, ich habe ja eine Vorliebe persönlich für Oper.*
[*Dann*] [*ich*] ***sehe*** *jetzt Don Giovanni von Mozart.*
[TüBa-D/S, s2852]

Schalowski (2017: 32) furthermore points out that in a considerable number of the cases, *dann* or *danach* are preceded by *und*. In these cases, *und* functions as a discourse marker that signals continuation rather than being a logical connector of two entities. Schalowski (2017: 33) argues that the first position in a declarative is a position between two discourse segments, which is why the adverbial is analyzed as a discourse marker. As pointed out before, Engel (1974) states that initial adverbials are more frequent in narratives or narrative parts of dialogues because they structure the discourse more effectively. Against this background, discourse-linking adverbials in V3 sentences should occur more often in narratives or narrative parts of dialogues, which indeed seems to be the case for the examples presented by Schalowski (2017). Hence, V3 makes use of the discourse-structuring function of adverbials in these discourse contexts, while at the same time exploiting the preference of the preverbal area to host the topic.

The structuring function of initial adverbials has been reported in other studies and for other languages as well. Grommes (2017) reports that multilingual students are more creative in placing *dann* in different positions in narratives compared to monolingual students. Birner (2004) finds that English *then* and is placed in non-canonical positions if it indicates a temporal ordering of discourse segments. Bestgen & Vonk (2000) explore the discourse function of initial adverbials in French. In their study, they show that temporal adverbs function as segmentation markers. Sentences with a topic shift were usually read slower than sentences with a continuous topic. However, in the experiment, this difference disappeared when a temporal adverbial appeared at the beginning of a sentence. Both studies highlight the discourse function of initial adverbials.

The differences between Adv-S-$V_{fin\ temporal}$ and Adv-S-$V_{fin\ frame\text{-}topic}$ are shown in Table 4. Adv-S-$V_{fin\ temporal}$ refers to V3 structures in which the adverbial mainly has a discourse-linking

function, while Adv-S-$_{Vfin\ frame\text{-}topic}$ refers to V3 structures in which the adverbial has a frame-setting function.

		Grammar	**Discourse pragmatics**
$AdvXV_{temporal}$	preverbal	Left-peripheral connective temporal adverb	Marking of a temporal connective at discourse level
$AdvXV_{frame\text{-}topic}$	preverbal	Adverbial constituent prototypically followed by the subject of the clause	Marking of a frame-setter and a topic within one utterance
	postverbal	Non-subject arguments and other adverbials	Commenting about the topic

Table 4: Properties of V3 types (Schalowski 2017: 34).

These differences are appealing; however, adverbials in V3 sentences do not always have a clear discourse-linking or frame-setting function. In fact, both functions can overlap in the same sentence, since both functions operate on different linguistic levels. *Dann* und *danach* lose their semantics in some cases, while still marking "a temporal connective at the discourse level" (Schalowski 2017: 34). This appears to be contradictory at first sight. However, nothing argues against a hybrid group of V3 that embraces both functions, frame-setting, and discourse structuring. In this sense, V3 generates a continuum with two poles, as illustrated in Figure 4.

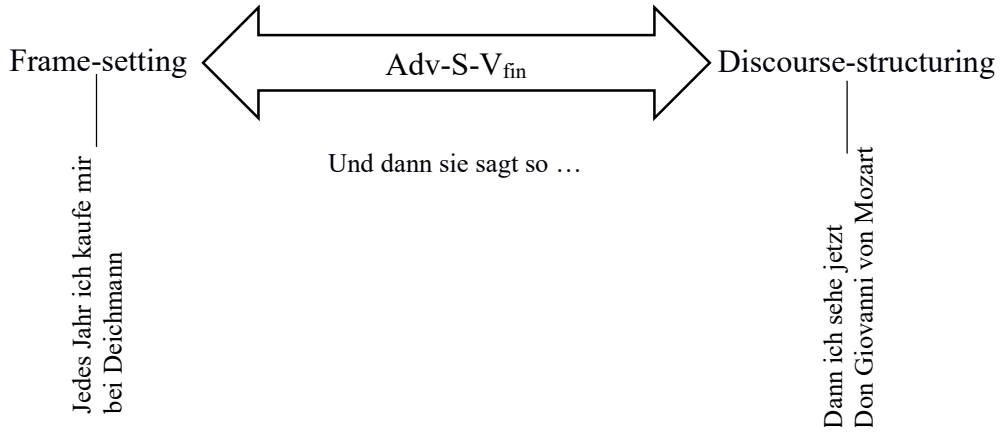


Figure 4: Continuum of V3 types.

One piece of evidence that reveals the prevalent discourse function of the adverbial is the second adverbial in a clause and full semantic bleaching of the initial adverbial. *Dann* and *Danach* are prototypical candidates for these adverbials. On the other end of the continuum, adverbials keep their semantics and set a frame for the following proposition. In between, some structures entail both characteristics. The exact function of the adverbial emerges through the context and the narrative structure of the environment in which the sentences appear.

In sum, the last sections show that the left periphery seems to be prone to encoding information-structural properties in contemporary German (Demske & Wiese 2016) as well as

in earlier stages of German (cf. Hinterhölzl, Petrova & Solf 2005). Moreover, it is the segment of the clause that interacts with discourse (Dürscheid 2010: 95) and thus contributes to creating coherence. These properties manifest in V3 sentences. The initial adverbial either links discourse segments or sets a frame for the following utterance, and the topic furthermore contributes to textual coherence via reference to entities of the preceding discourse. Thus, both elements interact with the preceding context while at the same time, they are the basis for the following material. Hence, they glue the preceding and the following text and simultaneously code different information-structural features, i.e., frame-setter and topic. In terms of filling the prefield, V3 follows the patterns found in V2 sentences, where subjects and adverbials are placed in the prefield more frequently than objects.

The studies on V3 presented so far, predominantly focused on the preverbal area. Furthermore, most of the studies are based on data from Kiezdeutsch, as the number of V3 structures is much higher here than in monolingual German. In the next section, I provide data from a corpus study, investigating V3 in monolingual German. To this end, I make use of TüBa-D/S (*Tübinger Baumbank des Deutschen/Spontansprache*) and a collection of fieldnotes. I examine whether the properties concerning the preverbal area identified in the literature so far hold for these kinds of data. Moreover, I focus on the verb and the postverbal area. Both areas have so far not been of major interest in the investigation of V3 sentences in German, however, they are equally important in the task of analyzing the grammatical structure of V3.

2.7 Corpus study on monolingual V3

In the present corpus study, I examine the preverbal area since this area has been the focus of previous studies investigating V3 in multilingual contexts. In particular, I examine the semantic class and syntactic category of the initial adverbial as well as the syntactic category of the subject. Additionally, I turn to aspects that have not yet been focused on in the literature: properties of the verb and the postverbal area. With respect to the verb, I focus on verb type (main verb, auxiliary, copula), transitivity, and tense. In the postverbal area, I investigate which constituent directly follows the verb and whether objects are realized or not. In this way, the study provides a more in-depth view of the grammatical preferences of V3. Thus, it gives valuable information regarding its status, which constitutes the first piece of evidence concerning the grammatical modeling of V3 in different theories of grammar. As a side-effect, the corpus study provides additional data that functioned as the basis for developing the stimuli in the acceptability judgment task and the self-paced reading experiment.

2.7.1 Methods and material

In multilingual contexts, there are many examples that we can draw on to infer the properties of V3. For monolingual German, however, the situation is more challenging since the structure is much less frequent. Schalowski (2015) makes use of personal fieldnotes ("BSa-Sch") and the TüBa-D/S (*Tübinger Baumbank des Deutschen/Spontan-sprache*) corpus to explore the properties of V3. TüBa-D/S and BSa-Sch cover different communicative settings. TüBa-D/S includes semi-informal conversation in which two interlocutors negotiate an appointment for a business meeting. This includes discussions about finding a suitable date, choosing a hotel, arranging the trip to the hotel, and discussing evening activities. Both interlocutors switch between *du* and the honorific form *Sie* in addressing each other, which indicates the semi-informal character of the conversation. The most recent version of TüBa-D/S consists of 360,000 words, which are manually syntactically annotated. BSa-Sch is a mixture of formal and informal utterances and is not limited to monolingual speakers. The collection comprises 32 sentences or small fragments of conversations. Each datum is equipped with meta-data concerning the source, date, place, and gender of the speaker. In many cases, it is thus unclear whether a V3 sentence was uttered by a monolingual or multilingual speaker. In particular, this is the case for utterances in public spaces, conversations on TV, the radio or on public transport.

Therefore, in the present study, I analyze my own fieldnotes (BSa-OB) and use instances of V3 reported for TüBa-D/S in Schalowski (2017). Most utterances in BSa-OB were produced in informal personal conversations with family and friends (all of which are adult monolingual speakers of German), while other instances were uttered on the radio, on TV, or in public spaces. Whenever it was not clear whether the speaker was monolingual, the data were excluded from the analysis. The collection comprises 35 sentences. In the analysis, I distinguish between both corpora, because both represent slightly different registers. Additionally, TüBa-D/S comprises data from a very specific text form (negotiation), while BSa-OB comprises informal speech.

2.7.2 Data annotation

The data were annotated regarding the status of the INITIAL ADVERBIAL (semantic class, token), SUBJECT (syntactic category), and VERB_{FIN} (verb type, transitivity, tense). VERB TYPES were Aux (auxiliary), Cop (copular), Main (main verb), and Mod (modal). Auxiliary verbs were all forms of *haben* ('have') und *sein* ('be') that formed an analytical verbal form together with another verbal part (e.g., nonfinite main verbs). Copular verbs were all forms of *sein* and *werden*

('become') that were part of the predicate, i.e., they form a syntactic unit with a predicative expression. Main verbs were all other verbs and *haben* in expressions like *Ich habe Hunger* ('I am hungry') or *Ich habe den Ball* ('I have the ball'). Concerning transitivity, copular verbs were annotated as "non", assuming they do not take object complements but predicative complements. The transitivity with auxiliaries was decided upon the transitivity status of the main verb of the same sentence. In analytical forms, tense was annotated according to the tense that both parts formed. In these cases, tense was only counted once. Due to the small number of occurrences, no statistical analysis has been conducted. Thus, the study serves as an exploratory pre-study that provides preliminary results that large-scale studies need to confirm.

2.7.3 Results

2.7.3.1 Monolingual informal spoken V3 (BSa-OB)

In BSa-OB, the majority of the adverbials were temporal. The second-largest group was local adverbials, followed by modals and conditionals. The adverbials varied in their lexical form, though some occurred more than once (*dann*, *gestern*, *jetzt*)

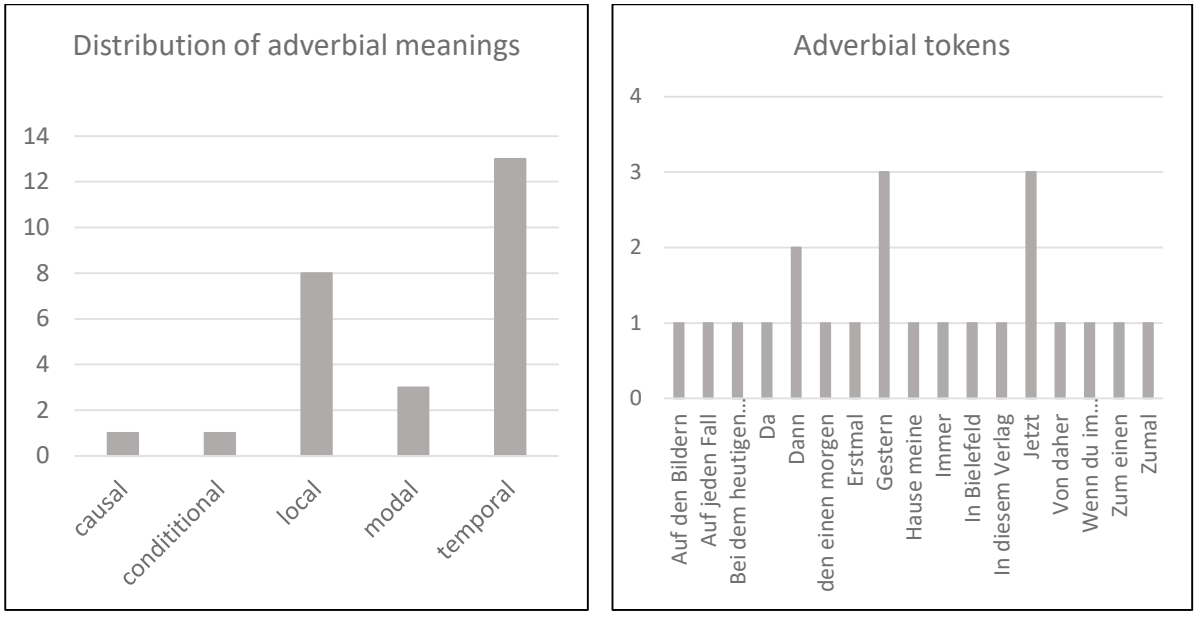
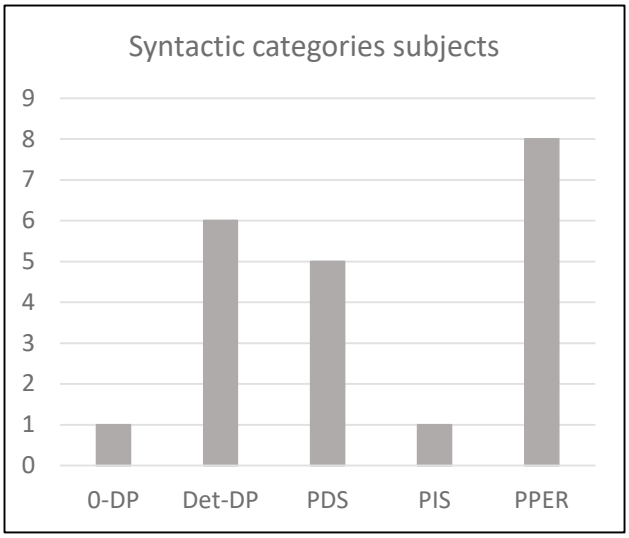


Figure 5: Distribution of adverbials and semantic classes of adverbials (BSa-OB).

Subjects occurred in various syntactic categories, most frequently as personal pronouns (PPER), and DPs with or without determiners (0-Det, Det-DP). Other categories were demonstratives (PDS) and indefinite pronouns (PIS).



0-Det Und dann *Herr Hoffmann* hat sich angeschlossen.

Det-DP Zu Hause *meine Mutter* schüttet auch immer den Kaffee weg.

PDS Früher war das so. Auf den Bildern *die* haben alle so geguckt.

PIS Aber immer *alle* sagen das

PPER Bei dem heutigen Rentenniveau *wir* müssen 2400€ im Monat verdienen im Monat

Figure 6: Distribution of syntactic categories in V3 sentences (BSa-OB).

The verbs occurred most frequently as main verbs and copular verbs. However, some instances of auxiliaries and modal verbs have been found. The vast majority of the verbs occurred in transitive function. Note that the high amount of "non" is due to the high number of copular verbs. Verbs appeared predominantly in present tense.

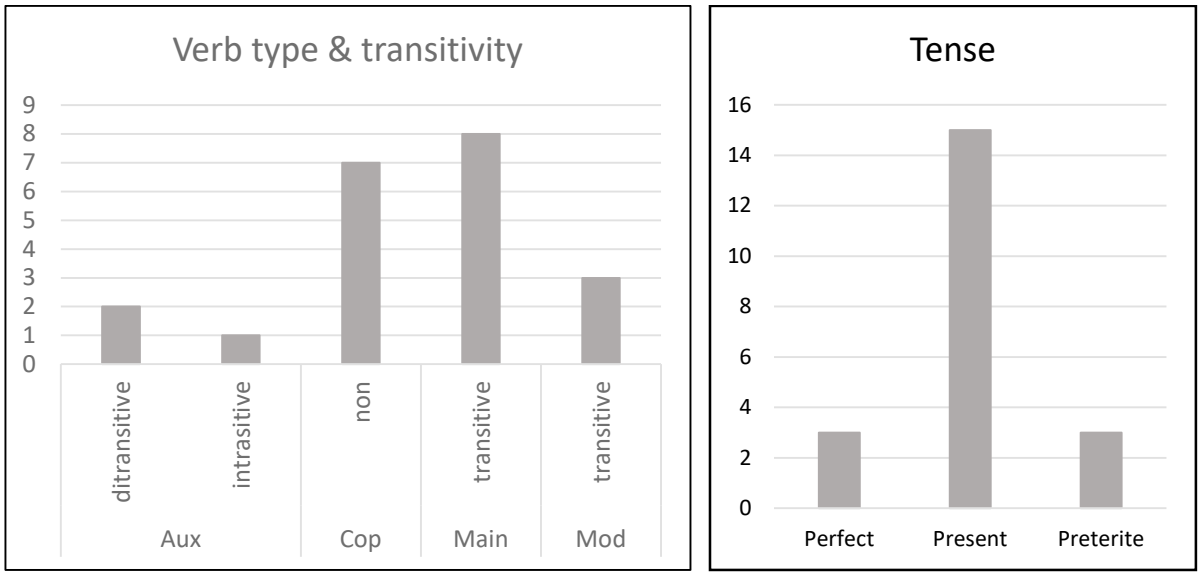


Figure 7: Distribution of type and transitivity status of the verb in V3 sentences (BSa-OB).

The immediate postverbal region consisted in most cases of the object or the adverbial, with the object occurring more frequently. In sentences with transitive and ditransitive main, modal, or auxiliary verbs, the sentences had overt objects in most cases. Only one sentence did not have an overt object.

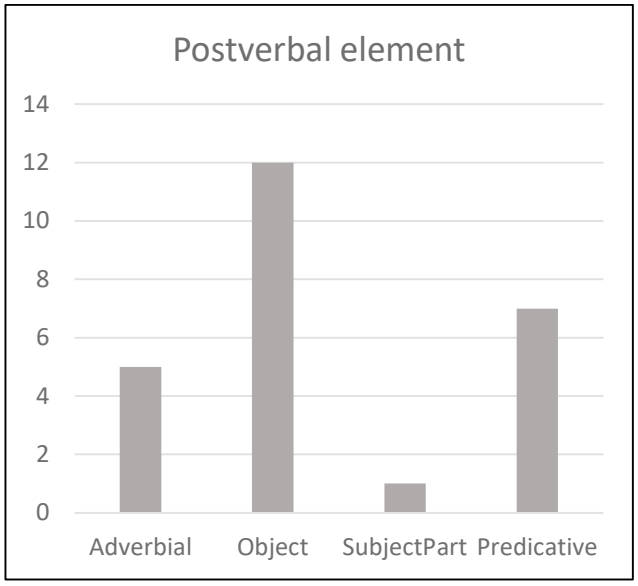


Figure 8: Distribution of constituents in the postverbal region in V3 sentences (BSa-OB).

2.7.3.2 Monolingual semi-informal spoken V3 (TüBa-D/S)

In the semi-informal context, some adverbials were ambiguous, e.g., in sentences like "da [temporal/local] die Fahrtzeit beträgt etwa eine Stunde, grob, dann müßten wir da sein…". The most frequent class was temporal adverbials. “Dann” was chosen as the initial adverbial in the vast majority of the cases.

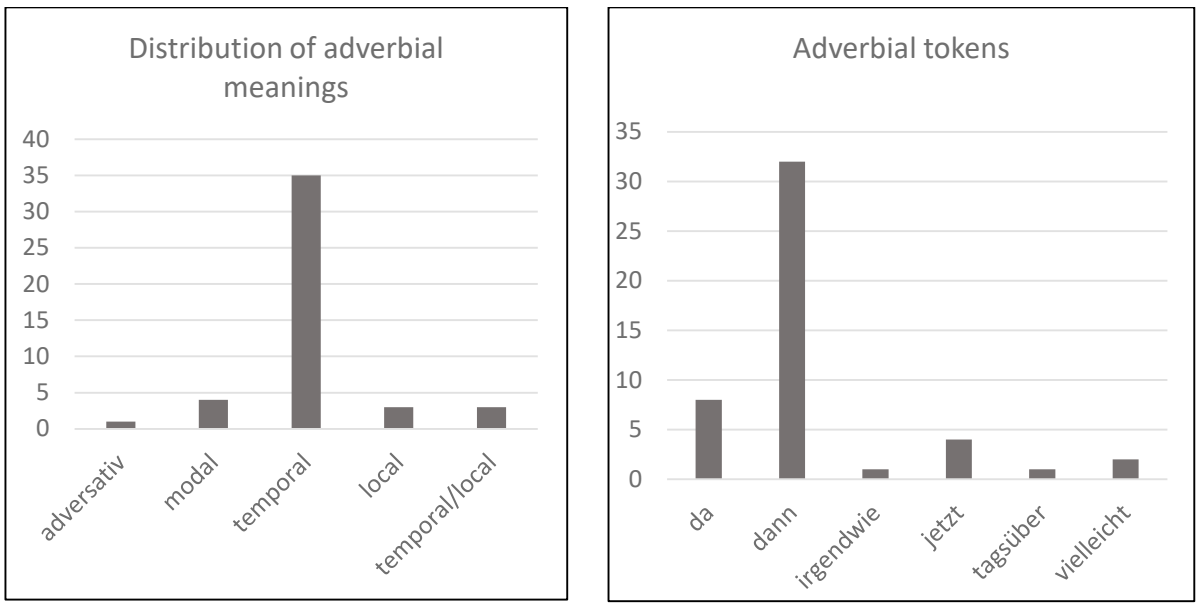
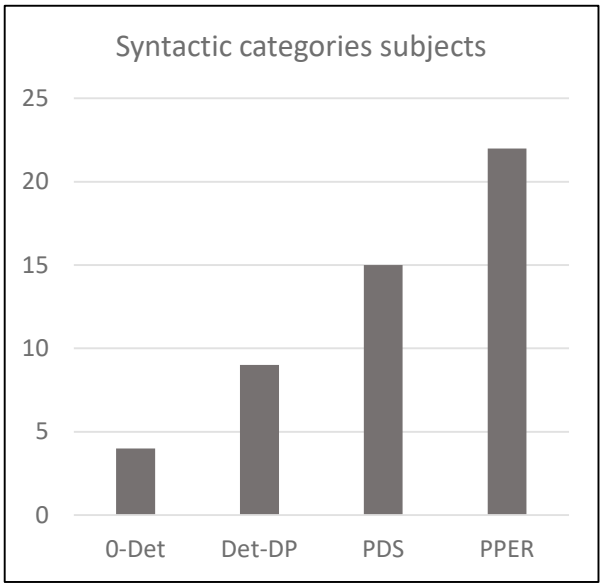


Figure 9: Distribution of adverbials and semantic classes of adverbials in V3 sentences (TüBa-D/S).

The predominant syntactic category for subjects were personal pronouns (PPER), demonstratives (PDS), and DPs with and without determiners (0-Det, Det-DP).



0-Det dann Hotel Luisenhof ist hundert neunundzwanzig

Det-DP dann der Zug fährt neun Uhr einundzwanzig

PDS dann das wäre eine gute Idee

PPER jetzt ich habe hier drei Hotels zur Auswahl

Figure 10: Syntactic categories of the subjects in V3 sentences (TüBa-D/S).

Similar to BSa-OB, the most frequent verbs were transitive main verbs in present tense or copular verbs in present form.

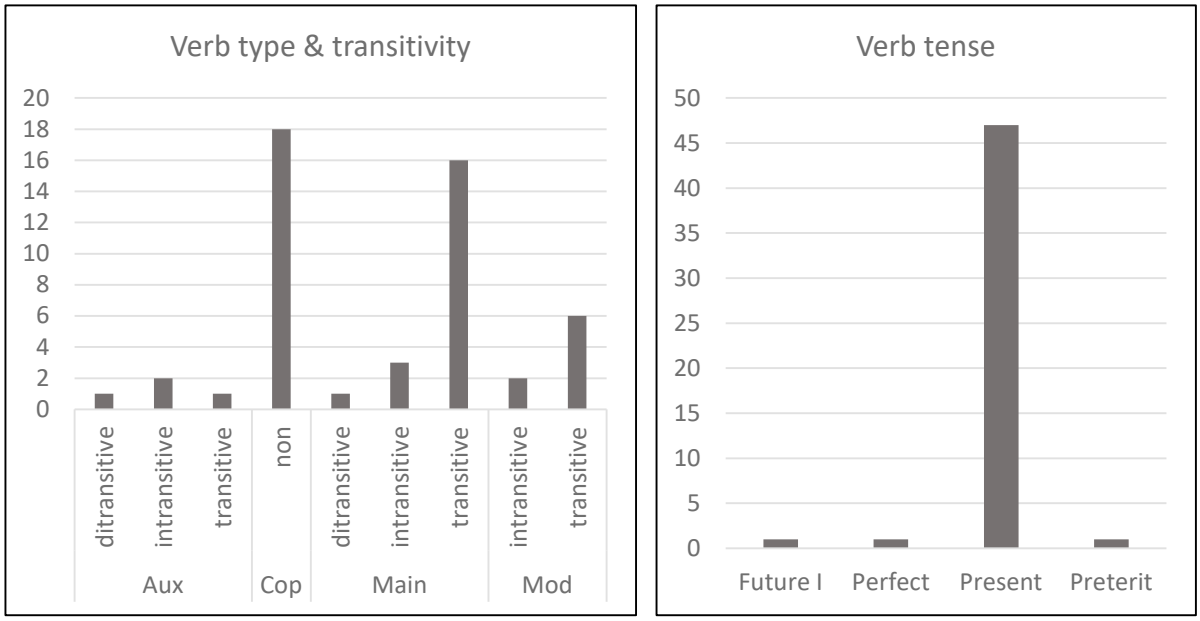


Figure 11: Verb and their transitivity status in V3 sentences (TüBa-D/S).

The immediate postverbal area predominantly hosts the object, though adverbials or predicatives also occur here. In sentences with transitive and ditransitive main, modal, or auxiliary verbs, the sentences had overt objects in most cases. Only two sentences did not have an overt object.

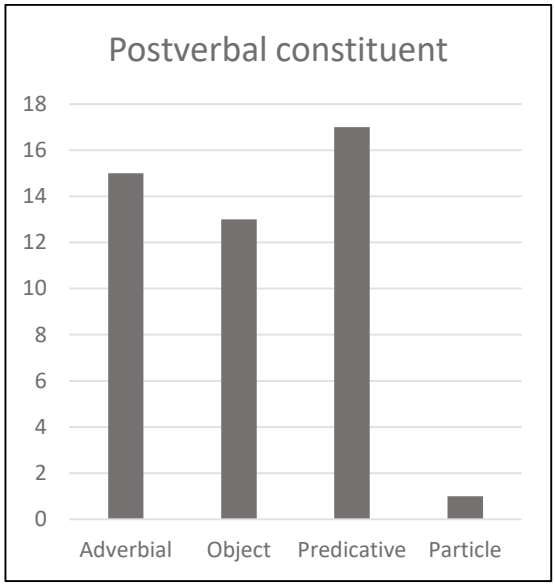


Figure 12: Distribution of constituents in the postverbal region in V3 sentences (TüBa-D/S).

2.7.4 Conclusion

The data confirm what has been previously stated for the structure of V3 in multilingual contexts. In most cases, the initial adverbial is temporal, even though local adverbials also occur. Modals, conditionals, and adversatives are less frequent. The two corpora differed in terms of the lexical diversity of the adverbials. While in BS-OB there was no preference for specific lexical items, in TüBa-D/S *dann* occurred most frequently, as has been previously reported for V3 (cf. Wiese & Müller 2018). As mentioned in section 2.5, also Speyer (2010) reports a special role for this particular adverbial in the first position in spoken German. Besides, the high frequency of *dann* might be due to the particular text form "negotiating an appointment". Interestingly, in most cases *dann* is used after the other discourse participant rejects a suggestion, e.g., for a hotel:

(55) ja, dann ich meine, es gäbe noch etwas anderes mit Solarium, Bar und Bistro und Sauna, das ist beim Hauptbahnhof in der Nähe, wobei ich die Hauptbahnhof-Gegend nicht so schätze. [TüBa-D/S, s23372]

The occurrence of *dann* also skews the distribution of the semantic class heavily towards temporal adverbials, even though the temporal meaning seems, at least to a certain extent, bleached in sentences like (55). Apart from ordering events in a temporal space, the speaker uses *dann* in order to indicate another suggestion, roughly in the sense of "If this does not suit you, *then* here is another option." However, the adverbials keep their semantics to a certain extent. This indicates the special status of *dann* functioning as both a discourse organizing

element as well as a frame-setter with temporal meaning. The data confirm a preference for pronominal subjects. Personal and demonstrative pronouns were more frequent than DPs.

A closer examination of the verbs revealed that V3 predominantly involves transitive main verbs in present tense. The postverbal area is occupied by the object or the adverbial and in most cases, the sentences had an overt object. The two corpora differed in the immediate postverbal constituent: In BSa-OB, the object followed the verb on most of the instances while in TüBa-D/S the difference between adverbials, subjects, and predicatives following the verb was small. Even though the linearization of middlefield constituents is rather complex, Zifonun et al. (1997) tentatively report that objects precede adverbials. However, there are differences in the constituent order in the middlefield, depending on the types of objects and adverbials. Even though there is too little data for V3 to draw reliable conclusions, the general picture in BSa-OB supports object >> adverbial linearizations in the middlefield, while this does not hold for TüBa-D/S. For that reason, more corpus evidence is needed to investigate the postverbal composition of V3. Still, the data indicate that objects are overtly realized in most cases.

The data presented in the study might reflect preferences that also account for V2 sentences, and hence it would be greatly revealing to systematically compare V2 and V3 with respect to the patterns described above. Nevertheless, the study sheds light on the V3 pattern itself without being accountable in a variationist sense (cf. Tagliamonte 2012).

Corpora for further studying V3 need to be consistent in terms of the registers they comprise. As the study shows, this has a strong influence on the data. The communicative situation is known to affect grammar, e.g., the use of specific tense forms (cf. Hennig 2000; Weinrich 1993, 2001), and word order, as the previous section illustrates. It is thus highly important that contexts and speaker groups are as homogenous as possible in the respective groups of interest in order to allow for comparability. A candidate for such corpora is the RUEG-corpus (Wiese et al. 2019), which, apart from formality, allows for comparing written texts with spoken texts of monolingual and heritage speakers of different languages.

2.8 Chapter summary

The chapter was dedicated to the grammatical and functional properties of V3. Since previous corpus studies predominantly focused on V3 in Kiezdeutsch, an additional corpus study was conducted in which the grammatical properties of V3 were identified in monolingual speakers. The findings coincide with Kiezdeutsch V3, and there is no difference between both speaker groups apart from the frequency of V3. The pattern is much more frequent in Kiezdeutsch than in monolingual German. Previous studies have shown that the initial adverbial

is either a frame-setter or a discourse marker and predominantly has a temporal or local meaning. The second constituent is, in all cases, a subject that functions as an aboutness/continuing/familiar topic. Both preverbal elements are unstressed and there is no indication of a prosodic boundary between the first two elements. Information structure plays an essential role in that V3 displays a strict FRAME-SETTER >> TOPIC linearization. The properties are summarized in Table 5.

Preverbal area		**adverbial**	**>> subject**
	Form	• different syntactic categories • different semantic classes, predominantly temporal	• subject • predominantly a personal pronoun
	Function	frame-setter or discourse linker, or both functions	aboutness or continuing/familiar topic
	• **prosodic boundary** between both constituents is **not mandatory**; no pitch accent on both elements, no pause between both elements		
Verb	predominantly transitive main verbs in present tense		
Postverbal area	• predominantly **overt objects** immediately following the verb • if non-objects follow, object occurs in most cases in another position in the clause		

Table 5: Properties of V3 sentences in German.

These findings are highly interesting concerning the status of V3 as declarative structures in German from the perspective of language use. V3 systematically makes use of specific properties that the German prefield provides. Prefield filling depends on many factors, such as formality (formal vs. informal) and discourse type (narration vs. dialogue). In particular, these aspects strongly affect adverbial placement. At the same time, these aspects have been reported to affect the occurrence of V3 sentences in German. The prefield prototypically hosts scene-setters and topics, especially *dann* and personal pronouns. It is the area that interacts with the preceding discourse and connects preceding and following utterances. In V3, both functions are fulfilled by placing a frame-setter/discourse linker and a topic in the preverbal area.

V3 thus fits into the linguistic makeup of the prefield in German, exploiting its functions. One might even go so far as to say that V3 structures optimize the prefield in placing two essential pieces of information, frame-setter and topic, in the initial position, where they function more effectively than in separate positions of the clause. Put differently, cognitively

and functionally, V3 has many advantages over V2, but it comes at the expense of the V2 constraint, which is considered a rigid constraint in German.

Apart from providing interesting insights into the status of V3 from the perspective of language use, the chapter provides the basis for further studies, i.e., the acceptability judgment task and the reading time experiment, presented in chapters 3 and 4. In order to investigate the acceptability and processing of V3, it is first of all essential to develop authentic material that can be tested in such studies. Chapter 2 provided the necessary information needed to create this kind of authentic material. Building on this, in the next chapter, I explore the status of V3 in terms of acceptability.

Chapter 3: The acceptability of V3

In this chapter, I investigate the status of V3 from the perspective of sentence acceptability, turning to the second research question of the thesis: How acceptable is V3? I compare V3 (Adv-S-V_{fin}) with unattested Adv-O-V_{fin} and different V2 sentences. This allows us to investigate whether V3 is generally perceived as less acceptable than V2 and whether some V3 structures are more acceptable than others. If verb placement is the only relevant factor for the acceptability of declaratives, then both V3 structures should be equally unacceptable. If, however, other factors, e.g., the elements occupying the preverbal region, play a role, then Adv-S-V_{fin} should be more acceptable than Adv-O-V_{fin} because it 1) fulfills structural and functional criteria of the prefield and 2) occurs in the input of speakers. One could then conclude that V3 in the form of Adv-S-V_{fin} has a grammatical representation, while Adv-O-V_{fin} does not.

The second purpose of the study was to pretest stimuli that were then used in the self-paced reading experiment. As the previous chapter illustrates, V2 and V3 require specific contexts. Hence, if there is no context or the wrong context is provided in further experiments, then V2 and V3 might cause processing difficulties, simply because they are not expected.

The chapter is structured as follows: First, I provide a brief overview of the relevant literature on the acceptability of V2 and V3. Second, I describe the predictions and methods of the study. Thirdly, I lay out details concerning the data analysis before turning to the results. Finally, I discuss the findings with respect to the overall research question, i.e., the status of V3.

3.1 Previous studies on the acceptability of V2 and V3

The acceptability of V3 is closely related to the acceptability of V2 in the sense that in both patterns, the preverbal area plays a significant role in rating the structures. For V2, this has been argued in a number of studies, which, for the most part, focus on subject-initial vs. object-initial V2 sentences. Many studies indicate a general "subject-first preference" (Hemforth 1993), which possibly overlaps with the agent-first preference mentioned above. Bader & Bayer (2006), e.g., investigate XP-fronting with ambiguous case markings and find that subject-first readings were preferred over other-first elements in reading time studies and acceptability judgment studies.[16] Similarly, Hemforth (1993) shows that object-initial V2 clauses are rated lower in acceptability. It is worth noting that in her acceptability judgment task, Hemforth (1993) did not provide any context for the stimuli that were tested. However, context has a

[16] Evidence for the subject-first preference comes from several studies. In a series of online and offline experiments, Schlesewski et al. (2000) show that there is a strong subject-first tendency for wh-questions (see Meng 1996 for similar findings). The subject-first preference was also found in the non-Germanic context (cf. Kaiser & Trueswell 2004 for subject-first in Finnish).

significant impact on the acceptability of object-initial V2 sentences, as has been argued in Weskott et al. (2011). In their study, the authors show that contexts only increased the acceptability of German OVS but not that of SVO. Second, OVS structures were rated significantly better than SVO with specific contexts, namely in "whole-part context". In these contexts, the referent is related to a concept that has previously been introduced in the discourse. In (56), *den Außenspiegel* ('the side mirror') has been introduced as part of the concept *Auto* ('car'). If an element is in such a *poset-relation*, it most likely occurs in the prefield (also cf. Speyer 2007).

(56) Peter hat den Wagen gewaschen.
'Peter has washed the car'
b. Er hat den Außenspiegel ausgelassen.
b'. Den Außenspiegel hat er ausgelassen. (Weskott et al. 2011: 7)

Bader et al. (2017) come to a similar conclusion; however, they attribute their findings to the type of the object and its relation to the previous context. They find that objects are rated as more acceptable than subjects in the preverbal position if the "object argument is related to a referent given in the prior discourse by the identity relation" (Bader et al. 2017: 45). In a number of sentence production studies, Bader et al. (2017) show that objects are located in the initial position if the following conditions apply:

1. The subject of the clause is inanimate or
2. the object in an experiencer or
3. the object is the topic.

Bader et al. (2017: 40) point out that "making the underlying object the sentence topic had a much stronger effect than varying the lexical-semantic properties of the verb and its arguments".

Interestingly, most studies that focus on the preverbal areas in V2 do not investigate subject and object-initial V2 in contrast to adverbial-initial V2. Hence, we do not know much about the acceptability of adverbial-initial V2 compared to the other two structures.

Similar to the importance of context in the acceptability of V2, Burmester et al. (2016) highlight that context also plays a significant role in the acceptability of V3. In their acceptability judgment study, the authors focus on the acceptability of adverbial-initial V2 in contrast to V3 in the form of Adv-S-V_{fin}. So far, this has been the only study explicitly exploring the acceptability of V3 declaratives. In the study, participants were asked to rate adverbial-initial V2 (A-V2), object-initial V2 (O-V2), Adv-S-V_{fin} (V3), and an unattested O-S-V_{fin}-Adv-structure. The stimuli were presented auditorily. In addition, all sentences were supported by visual context (comic strips) in which the subject was either an aboutness topic, a contrastive

topic, or both subject and verb were discourse-new. The study showed that V3 was rated worse than V2, but all sentences were rated significantly better if the subject was marked as the topic in the visual context. Adv-S-V_{fin} was rated better if the subject was marked as an aboutness topic, supporting the findings from previous corpus studies. In contrast to the studies mentioned above, Burmester et al. (2016) compare the ratings of A-V2 sentences and O-V2 sentences, revealing that A-V2 is rated significantly better than O-V2. However, they did not include S-V2. Since context has an essential influence on the acceptability of V2 and V3, in the acceptability judgment task below, I provide the sentences with contexts that allow for the objects to be interpreted as the topic. Furthermore, the sentences allowed the subjects to be interpreted as aboutness or continuing topics, triggering Adv-S-V_{fin} readings.

In sum, it seems that initial objects in V2 require specific contexts, while initial subjects are judged to be more acceptable per default. V3 lies in-between those two options; it also requires a specific context, even though the immediate preverbal constituent is a subject. Since we do not know much about the acceptability of initial adverbials, V3 could be also affected by factors that influence the acceptability of adverbial-initial sentences. However, as the previous chapter has shown, initial adverbials are prone to be placed first if they are scene-setters or if they occur in narratives. For V3 structures, these findings are of great value because they allow for predictions concerning acceptability ratings. These predictions are presented in the next section.

3.2 Predictions

From the literature, I predict the following concerning V2 sentences. First, there should be no differences between S-V2 and O-V2 since the context preceding the stimuli allows for topicalized objects but also initial subjects. There also should be no differences between A-V2 and the other V2 structures since there are no specific restrictions for A-V2 (e.g., in terms of discourse context, i.e., monologue vs. dialogue). Third, the semantic class of the adverbial should have no effect on the acceptability ratings.

I expect V3 to be judged as less acceptable than V2 due to several factors: Adv-X-V_{fin} violates the V2 constraint that is regarded as a strict constraint in standard German and that speakers are aware of. Language users might have encountered Adv-X-V_{fin} in the context of second language acquisition and highly stigmatized varieties of German such as Kiezdeutsch and thus consider these structures to be unacceptable in German. Put differently, in judging acceptability, I expect speakers to be highly sensitive in terms of detecting potential "errors". From the literature, I expect a second result: If a specific context allows for both preverbal objects and preverbal subjects in V2 declaratives, then we should find similar acceptability

ratings for Adv-S-V_{fin} and Adv-O-V_{fin} or at least the ratings should differ to the same degree as is the case of subject-initial and object-initial V2. Both V3 structures should be similarly acceptable or unacceptable if the context allows for preverbal subjects and objects in V2. If, however, Adv-S-V_{fin} has a different status than Adv-O-V_{fin}, this should be visible in different acceptability ratings. Furthermore, I expect Adv-S-V_{fin} to be judged as more acceptable with temporal and local adverbials since they are 1) more frequent than other adverbials such as modal adverbials and 2) function as prototypical frame-setters (cf. Erteschik-Shir 1997: 27). The acceptability judgment study in this section builds on previous findings regarding the acceptability of V2 and V3. It comprises S-V2, O-V2, and A-V2 as well as V3 clauses in order to allow for a direct comparison of these structures.

3.3 Methods

3.3.1 Participants

77 participants took part in the experiment: 63 were monolingual while ten were multilinguals with different L1s in addition to German (Turkish, Arabic, Polish, English, Czech, Slovenian, Swiss-German, and Croatian). These participants were excluded as well as participants who displayed very short handling times of the study or who did not fill out the questionnaire concerning their linguistic biography. One participant took part in the study twice but only the first participation was included in the analysis. Ultimately, 61 monolinguals were included in the analysis. The vast majority of these participants were female (n_{female}=50; n_{male}=10; $n_{non\text{-}binary}$=1), and the mean age was 24.6 years (SD=6.8).

3.3.2 Stimuli

Five different word orders were tested, three V2 and two V3 structures. The stimuli differed in word order only. The V2 clauses started with either a subject, an object, or an adverbial. The test items for Adv-S-V_{fin} structures were created based on the structural and functional properties discussed in chapter 2:

- The subject occurred as a personal pronoun
- The subject was always a non-contrastive topic
- The adverbial appeared in various semantic classes

Table 7 on page 51 illustrates the stimuli, grouped into V2 and V3 conditions. The verb occurred in region 1 in V2 sentences and region 2 in V3 sentences. Following the findings of the corpus study in chapter 2, I used transitive main verbs in present tense with overt objects. Even though adverbials in Adv-S-V_{fin} can appear in various syntactic categories, I used simple

lexical units (i.e., no complex phrases such as CPs or PPs) that had either modal, temporal, and local meaning. These adverbials were chosen due to their function and their occurrence in V2 and V3 sentences: Temporal adverbials appear most frequently in V3 sentences, where they function as frame-setters and discourse linkers. Local adverbials are also frame-setters that occur in V3, but less frequently so. As prototypical frame-setters, both local and temporal adverbials operate over the whole clause. In contrast, modal adverbials typically do not have a frame-setting function because they are usually closely related to either the verb or the subject. This also applies to V2 sentences, as illustrated in section 2.4: temporal, local, pragmatic, and situational adverbials appear more frequently in the prefield than modal adverbials. Thus, temporal and local adverbials might increase the acceptability of sentences with initial adverbials. *Dann* was excluded due to its specific behavior, which might have skewed the data. As Speyer (2010) indicates, *dann* is a lexical item that is typical for dialogs and it occurs most frequently with V3 sentences (Wiese & Müller 2018). Since the semantic class of *dann* is temporal, temporal adverbials might be rated better due to this particular lexical item. In order to allow for a comparison between the three adverbial classes, I tested five different adverbials per adverbial class. These five lexical items per group were repeated three times in three different sentences with each condition. This led to a total amount of 45 stimuli, each of which was presented in one of the five conditions per list. The lists were distributed over the participants. Table 6 illustrates the distribution of the conditions using the Latin square design.

	List 1	**List 2**	**List 3**	**List 4**	**List 5**
Item 1	A	B	C	D	E
Item 2	E	A	B	C	D
Item 3	D	E	A	B	C
Item 4	C	D	E	A	B
Item 5	B	C	D	E	A

Table 6: Distribution of all conditions over 5 lists using the Latin square design.

As the literature shows, context is of great importance in rating the acceptability of V2 and V3 sentences. Hence, each sentence was preceded by a context sentence. In addition, the context sentence provided the antecedent for the personal pronoun in the test item, facilitating plausible interpretations. Each test sentence included two objects. The context allowed for an interpretation for one of these objects as the contrastive object. The acceptability judgment task included 90 fillers that were also equipped with context sentences. Two representative examples for the test items are given in (57) and (58).

(57) Context: *Mit meinen Freunden denke ich mir vor dem Spaziergang einen gemeinen Streich und eine hinterhältige Intrige aus.*
Target: Wir proben den Streich später und lachen.

(58) Context: *Die Erzieher wissen schon vor dem Reingehen, dass der Jüngste und einige Ältere Probleme mit ihren Schnürsenkeln haben*.
Target: Drinnen helfen sie dem Jüngsten und summen.

As the examples illustrate, the target sentences ended with *und x* ('and x') after the critical area, where *x* was a finite verb agreeing in grammatical features with the subject. The two segments function as spill-over areas in the self-paced reading experiment. These areas were included in order to detect potential sentence wrap-up effects, i.e., effects that do not occur during the processing of the critical region (in the case of the study, regions 0 – 4) but that are only visible at a later stage in sentence processing (cf. Just et al. 1980, Daneman & Carpenter 1983).

Condition[17]				Critical Regions				Spill-over	
	Verb placement	Word order	Condition	0	1	2	3	4	5
A	V3	AOVS	AO-V3	Nachher	den Hund	streichelt	ihr	und	grinst.
B		ASVO	AS-V3	Nachher	ihr	streichelt	den Hund	und	grinst.
C	V2	AVSO	A-V2	Nachher	streichelt	ihr	den Hund		
D		SVOA	S-V2	Ihr	streichelt	den Hund	nachher		
E		OVSA	O-V2	Den Hund	streichelt	ihr	nachher		

Table 7: Conditions used in the acceptability judgment task.

[17] For reasons of clarity and comprehensibility, in the following section, I refer to Adv-S-V_{fin} and Adv-O-V_{fin} as AS-V3 and AO-V3, respectively.

3.3.3 Procedure

All items were equally distributed over five lists using the Latin square design. Each list included all the test items in a different condition. This approach prevents a participant from reading the same sentence in different conditions, which could reveal the purpose of the study. At the same time, it ensures that all sentences are read in all conditions. Five different links, each leading to one of the five lists, were distributed via social media and university classes at the University of Potsdam. Participants were allowed to take part in a lottery in which they could win one of six vouchers (€20.00 each) for an online store.

The experiment started with an introduction explaining that the experiment intended to investigate everyday language use of German. Participants were asked to rate sentences on a Likert Scale (1 – 7) where only the extremes were labeled, with 1 meaning that the participant would most likely utter a particular sentence and 7 meaning that the participant would most likely never utter such a sentence. Pauses were possible at anytime. Participants took an average of 50 minutes to finish the experiment. The introduction also included a brief training session in which the participants were familiarized with the task. Participants first saw an example in which a context sentence preceded the critical sentence, that was highlighted by an arrow. Participants were told that in the experiment, they would be asked to judge only the sentence indicated with the arrow in the example. The introductory sequence was followed by a training sequence consisting of three training sentences. After this training, the test phase started.

3.4 Data analysis

Participants who completed the task in less than 15 minutes were excluded from the analysis. Following the findings in Juzek (2016), z-scores were computed for each participants' ratings (including the ratings for the fillers, excluding practice items prior to statistical analyses), since z-scores are reported to be more informative than basic data. The data were then analyzed in a linear mixed model in R (R Core Team 2015) using the lme4 package (Bates et al. 2015) and the multcomp package (Hothorn et al. 2007) to obtain p values with Holm adjustments for multiple comparisons. The model was fitted in the following way: The maximal model contained condition as a fixed effect and random intercepts and random slopes for items and participants. The model was fitted by subsequently eliminating random slopes and comparing the limited models with the maximal model. A log-likelihood ratio test revealed that the exclusion of random slopes for participants, but the inclusion of random slopes for items provided the best fit. An additional model was computed in which semantic class was also

included as a fixed factor. Comparing both models in a log-likelihood ratio test revealed whether the semantic class affected the ratings.

3.5 Results

Both V3 sentences were rated as less acceptable compared to the V2 sentences. AO-V3 sentences were rated with a mean value of 6.53 (SE=0.12), while AS-V3 were rated slightly more acceptable (mean=5.99, SE=0.15). Within the V2 conditions, A-V2 sentences were rated as the most acceptable structure (mean=3.11, SE=0.27). O-V2 and S-V2 were rated similarly, with means of 3.79 (SE=0.25) and 3.73 (SE=0.26), respectively. Table 8 and Figure 13 summarizes the results.

Condition	Mean rating	Standard error
AO-V3	6.53	0.12
AS-V3	5.99	0.15
A-V2	3.11	0.27
O-V2	3.79	0.25
S-V2	3.73	0.26

Table 8: Mean ratings of the acceptability judgment task (raw data).

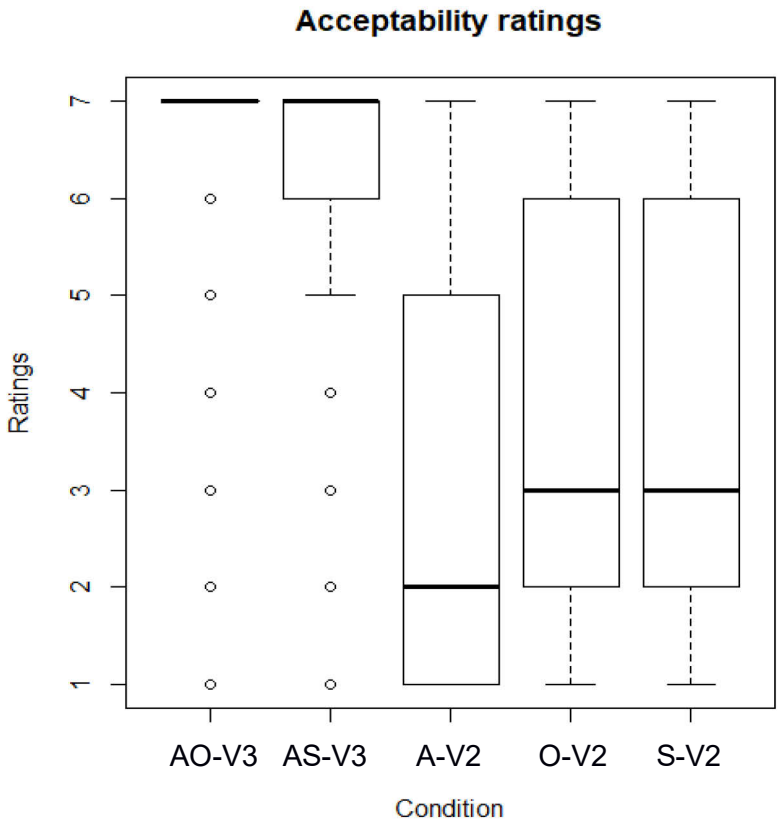


Figure 13: Acceptability ratings in the acceptability judgement task; 1=acceptable, 7=not acceptable.

The difference of the mean ratings (z-scores) is highly significant between AO-V3 and all other conditions. The same holds for AS-V3 and all other constructions (see Tables 9 and 10). The difference between both V3 conditions was slightly less significant, but it still clearly fell below α ($p < 0.0005$). The difference between O-V2 and A-V2 was significant ($p < 0.003$), as well as the difference between the mean ratings for S-V2 and A-V2 ($p < 0.011$). The difference between S-V2 and O-V2 was not significant ($p < 0.71$). Table 10 summarizes the pairwise comparisons.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmer Test'], Formula: Zscore ~ Condition + (1 + Condition | Item) + (1 | Participant)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-1.03863	0.03070	473.42715	33.84	< 2e-16 ***
AS-V3	0.22059	0.05715	72.20472	3.86	0.000245 ***
A-V2	1.37876	0.06366	68.48302	21.66	< 2e-16 ***
O-V2	1.10589	0.06599	60.09551	16.76	< 2e-16 ***
S-V2	1.13871	0.07113	61.38673	16.01	< 2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 9: Output of the linear mixed model for the z-score comparisons.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Zscore ~ Condition + (1 + Condition | Item) + (1 | Participant)					
		Estimate	Std. Error	z value	Pr(>|z|)
V3	AS-V3 – AO-V3	0.22059	0.05715	3.860	0.000454 ***
V2 vs. AO-V3	A-V2 – AO-V3	1.37876	0. 06366	21.657	< 2e-16 ***
	O-V2 – AO-V3	1.10589	0. 06599	16.759	< 2e-16 ***
	S-V2 – AO-V3	1.13871	0. 07113	16.008	< 2e-16 ***
V2 vs. AS-V3	A-V2 – AS-V3	1.15817	0. 07543	15.354	< 2e-16 ***
	O-V2 - AS-V3	0.88530	0. 07740	11.438	< 2e-16 ***
	S-V2 - AS-V3	0.91812	0. 08183	11.221	< 2e-16 ***
V2	O-V2 - A-V2	-0.27287	0. 08231	-3.315	0.002749 *
	S-V2 - A-V2	-0.24005	0. 08649	-2.776	0.011019 *
	S-V2 - O-V2	0.03282	0. 08821	0.372	0.709843
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 10: Pairwise comparisons for mean ratings (z-scores) in the acceptability judgment task.

Semantic class did not have a significant effect on the ratings ($\chi^2(2) = 3.1876$, $p = 0.2031$).

3.6 Discussion

The data partly confirm the predictions mentioned above. V3 was rated significantly less acceptable than V2, which reproduces and supports the findings in Burmester et al. (2016), making use of a different method. However, the significant difference between the V3

structures suggests that verb placement is not the only factor that comes into play when judging the sentences. In light of the V2 constraint, advocated as a rigid constraint in German, this is a rather interesting finding. Either verb placement does not have as much of an impact on acceptability as expected, or other factors have an even more substantial influence on acceptability ratings. The findings from corpora for both V3 and V2 sentences suggest that one of these factors is the preverbal area. Even though AS-V3 was rated significantly less acceptable than the V2 sentences, AO-V3 was rated even less acceptable then AS-V3. Thus, verb placement is not the only factor in judging declaratives; the pre- and/or postverbal area also have a strong impact. The difference between AO-V3 and AS-V3 shows that the structure that is attested in corpora is more acceptable than the unattested V3 structure. Another interesting finding arises when comparing the ratings of V2 and V3. O-V2 does not differ from S-V2, but AS-V3 differs from AO-V3. Thus, the conditions that license preverbal objects do not hold for AO-V3 structures, indicating that AS-V3 has a different status than AO-V3 in German.

The semantic class of the adverbial did not affect the acceptability of V2 and V3, showing that temporal, local, and modal adverbials can occur in the initial position without influencing the acceptability of the sentences. This was not predicted; however, the result mirrors the corpus findings discussed in chapter 2, which showed that, in principle, the initial adverbial can occur in all these classes.

The ratings for the V2 sentences indicate that there was no difference in the acceptability of S-V2 and O-V2. In addition, and probably even more interestingly, A-V2 was rated as the most acceptable structure. This is partly in line with Burmester et al. (2016). In their study, the authors find that A-V2 is rated better than O-V2, but the study did not compare A-V2 and O-V2 with S-V2. It is somewhat surprising that A-V2 sentences outperform S-V2 in acceptability, especially since S-V2 is often considered to be the default and most unmarked V2 candidate. As mentioned before, though, Engel (1974) reports more adverbial-initial sentences in monologues and narrative parts in dialogues, whereas initial subject clauses were more frequent in dialogues. The stimuli in the acceptability judgment task might convey the impression of a narrative rather than dialogue, which could make A-V2 more suitable and which would account for the higher acceptability. Moreover, the data support Speyer's (2010) claim that the initial position preferably hosts scene-settering adverbials.

If frequency determines acceptability, we would expect object-initial V2 to be less acceptable than the other V2 structures since it is overall less frequent (see chapter 2.4). However, this is not borne out, and therefore sheer frequency does not account for acceptability.

Instead, contextual information that allows for different initial elements plus the discourse type (i.e., narration vs. dialogue) makes some structures more acceptable in specific situations than others. This is in line with previous findings on the influence of context in sentence processing and production (cf. Bader et al. 2017, Weskott 2003, Weskott et al. 2011).

Apart from these interesting grammatical findings, the study also revealed important methodological aspects: It is noteworthy that an acceptability judgment task on written sentences yielded such findings, given that speakers are presumably sensitive to violations of standard grammar when taking part in such a study. It shows that even such deviations from standard language can be tested in acceptability judgment tasks. The fact that this method revealed differences between AS-V3 and AO-V3 with AS-V3 being significantly more acceptable indicates that AS-V3 has a different status than AO-V3 in German. It might even be the case that AS-V3 is captured by German grammar while AO-V3 is not. Besides, the findings on the acceptability of V2 and V3 strongly suggest that the stimuli are suitable for the self-paced reading experiment. The context sentences allowed for all the interpretations, i.e., initial subjects and objects in V2 clauses and AS-V3 in V3 sentences.

The acceptability judgment task came with three potential problems that were avoided due to the experimental setup and data analysis. First, the random distribution of the lists and the online character of the questionnaire lead to immense differences in the number of filled out questionnaires. For example, the first list was judged by 26 people, while the second list was judged by 12 people. However, it was ensured that each list was rated by at least ten monolingual participants. Second, participants who "clicked through" the questionnaire without paying much attention to the stimuli were detected and excluded. The same holds for participants who participated multiple times in different lists in order to increase the chance of winning the voucher. Accordingly, participants who finished the questionnaire in less than 15 minutes were excluded. Likewise, participants with the same IP number or identical information in the linguistic biography, indicating multiple participations, were excluded. A third potential problem concerns the linguistic background of the participants. The target group of the experiment was speakers who grew up with German as their only family language. This was assured by asking participants to fill out a questionnaire after the experiment. In the questionnaire, participants were asked to provide information about their linguistic behavior. Among other things, the participants were asked to list the languages 1) that they are able to speak, 2) that they speak at home, and 3) that they speak in their spare time. In this way, multilinguals were distinguished from participants who grew up in monolingual households.

Consequently, a small number of pilot-data of multilingual speakers was gathered that could be used for further research.

3.7 Chapter summary

In this chapter, I explore the status of V3 structures from the perspective of acceptability. The main purpose of the chapter was to test whether all V3 structures are rated similarly unacceptable compared to V2 structures, or whether Adv-S-V_{fin} are rated as more acceptable as the unattested Adv-O-V_{fin} structure. The stimuli for the study were developed considering the findings concerning the structural and grammatical properties of V3, presented in chapter 2. I spelled out the impact of context on acceptability ratings. Both O-V2 and Adv-S-V_{fin} require specific contexts: O-V2 sentences receive better ratings if the object is made a contrastive topic that occurs in the same form in the preceding context. Adv-S-V_{fin} structures must entail a subject that functions as the aboutness or the continuing topic, triggered by the context. Subjects in S-V2 sentences function as the default element in the initial position and require no specific conditions. Adverbials, on the other hand, are favored in the initial position in V2 if they occur in narratives, are scene-setters, or occur as the lexical item *dann*.

The acceptability judgment task revealed that Adv-S-V_{fin} and Adv-O-V_{fin} were judged differently in terms of acceptability. Both were judged as less acceptable than the V2 sentences, but Adv-S-V_{fin} was judged as more acceptable than Adv-O-V_{fin}. This points to a big difference between Adv-S-V_{fin} and Adv-O-V_{fin} in terms of function as well as grammatical representation. While Adv-S-V_{fin} might have a syntactic representation and function, Adv-O-V_{fin} does not. Both structures have different statuses.

A secondary finding from the acceptability judgment task was that the stimuli used in the study allow for O-V2. O-V2 was rated as acceptable as S-V2. This finding indicates that structures should not be read slower because they are not acceptable in a specific context. A-V2 was rated as the most acceptable candidate. Even though previous research has shown a strong subject-first preference, adverbials are hardly considered in acceptability judgment tasks. The findings are compatible with a scene-setting first preference, as identified in Speyer (2010). The findings on subject- and object-initial V2 imply that the stimuli constitute authentic material that is suitable for the self-paced reading experiment. Since the study could successfully show that the stimuli meet the specific restrictions of O-V2 and Adv-S-V_{fin}, the same items were used for further testing in order to investigate the processing of Adv-S-V_{fin}. The next chapter deals with the status of V3 from the perspective of sentence processing, taking into consideration the results from chapters 2 and 3.

Chapter 4: V3 in language processing

This chapter deals with the third research question RQ3 contributing to our investigation: How are V3 sentences processed? To answer this question, I present data from a self-paced reading experiment that compared adverbial-, object-, and subject-initial V2 sentences, Adv-S-V_{fin}, and Adv-O-V_{fin} sentences. The study sheds light on the status of V3 because it shows how the human parser copes with the structure in comparison to unattested Adv-O-V_{fin}, and V2. The last chapters showed that several grammatical and functional conditions license V3. These conditions do not hold for unattested Adv-O-V_{fin}, which reflects in differences in the acceptability ratings of Adv-S-V_{fin} and Adv-O-V_{fin}. This chapter investigates whether the status of V3, as a special case of declarative sentences in German, is also visible in sentence processing. In a second step, findings from this psycholinguistic study allow us to draw conclusions concerning the grammatical representation and modeling of V3 declaratives (=RQ4). A theory of grammar must account for differences in processing, if, as assumed in this dissertation, psycholinguistic evidence is taken to be fundamental for grammatical theory.

To this end, I focus on two regions that are of particular interest in exploring the status of V3 declaratives: the preverbal area and the verb position. Initial constituents in V2 declaratives have been shown to differ in terms of processing, as I will illustrate below. Thus, investigating how the preverbal position is processed in V2 can give us valuable clues to explain the processing of V3 sentences. Furthermore, the preverbal area in V3 is particularly revealing because it deviates from V2 and, as illustrated in the previous chapters, makes use of functional and grammatical properties that the German prefield. Investigating the processing of the verb is important for two reasons. First, the lexical verb has been reported to show effects in relation to word order in previous studies (see Bader & Meng 1999, Gorrell 2000). Second, since V3 deviates from the most common declarative type, namely V2, in verb placement, one might assume that processing a declarative clause is easier with the verb in the second position instead of the third position. In other words, the position of the verb generally might have a strong impact on processing the verb. However, processing the postverbal position might also be highly revealing because it shows us how the parser integrates upcoming segments after the critical segments (the preverbal and the verbal position). Additionally, as highlighted in chapter 3, it has been reported that some effects are only visible in later regions of the clause. Therefore, I will also include analyses of the postverbal area.

The chapter is structured as follows. First, I provide necessary background information from the literature focusing on aspects that have been reported to strongly influence sentence

processing: the architecture of the parser (section 4.1.1), expectations and surprisal (section 4.1.2), and context and frequency (sections 4.1.3 and 4.1.4). Second, I report on findings concerning the processing of preverbal and verbal information (section 4.1.5). These aspects are the theoretical and empirical basis for interpreting the data from the self-paced reading experiment. The study itself is reported in section 4.3.

4.1 Background on sentence processing

4.1.1 The architecture of the parser

In spoken languages, sounds encode information. This information is bound to the limitations of time and space, and sentences incrementally unfold as they are produced. Most psycholinguistic models assume that the parser analyzes structures from left-to-right and top-down (Frazier & Fodor 1978, Crocker 1994). This means constituents are attached to the structures as they are perceived, i.e., before the phrasal head might be reached. However, in some cases, the parser delays the interpretation of the sentence until the end (Just & Carpenter 1980). Understanding the mechanisms of the parser is crucial in understanding sentence processing and, eventually, the status and grammar of V3 declaratives. If we assume that linguistic information, such as grammar, pragmatics, context, discourse, and text type, guides sentence parsing and if parsing can be tested in empirical studies, then empirical studies can give us an insight into grammar.

Ambiguities are particularly fruitful for understanding the architecture of the parser. In V3, a generally ambiguous position is the initial position. After the adverbial occurs, the parser might expect a verb to come next, because it predicts a V2 declarative with an initial adverbial. If the parser expects the verb in the second position, it encounters difficulties when the second element is a subject, as it is the case in Adv-S-V_{fin} sentences. The parser then either needs to re-analyze the predicted structure or re-rank the activated structures that are predicted as potential candidates. This implies that the parser automatically anticipates words or even whole structures when receiving linguistic information. This capability of anticipation can lead to processing problems, for example, in garden-path sentences. Example (59) illustrates a typical garden-path sentence:

(59) The horse raced past the barn fell. (Bever 1970: 316)

The sentence displays a local ambiguity on the verb *fell* because the parser wrongly analyses *raced* as the main verb of the clause. *Fell* then leads to conflict because the structure does not

allow two main verbs. For that reason, an alternative structure needs to be taken into consideration in order to deduce an appropriate structure and meaning of the clause. The only possible interpretation is to analyze *raced past the barn* as an attribute in passive voice:

(60) [The horse [raced past the barn] fell]

While local ambiguities in garden-path sentences can be resolved, global ambiguities are, in principle, vague in structure and meaning. In (61), at least two structures are possible:

(61) a. Louis told [the girl that Bill liked] the story.
b. Louis told the girl [that Bill liked the story]. (Gieseking 2000: 29)

Without context, it is impossible to determine which structure is intended by the speaker. However, speakers share an intuition about which interpretation applies. This indicates that the parser follows specific strategies in analyzing sentences. In the literature, there are several competing parsing models that, among many other things, explain ambiguity resolutions:

a) modular vs. non-modular/interactive
b) parallel vs. serial parsing[18]

Modular theories argue that linguistic knowledge is organized in different modules that either do not interact or interact only to a minimal extent. According to Drenhaus (2010: 97), information goes unidirectionally from one module to another: Syntactic information cannot be influenced by semantics or pragmatics. Modular accounts often assume serial parsing mechanisms: The parser anticipates a structure and is forced to re-analyze sentences if the initial analysis turns out to be incorrect. Mitchell (1994: 378) states that the parser either provides "serial analysis without annotation" or "annotated serial analysis". In the first case, the parser assumes a non-ambiguous and grammatical structure. In the second case, the parser detects potential ambiguous constituents and marks them, facilitating reanalyzing the sentence at a later stage of processing. Serial parsing models usually object to the notion that pragmatic information and world knowledge immediately influence the parsing. The first analysis is always guided by syntactic information (cf. Frazier et al. 1983). Levy (2008) refers to these models as "resource-limited theories" because in these models some structures require more cognitive resources than others only due to their syntactic structure. Cognitive resources are limited, and if the resources are exceeded, this is reflected in a higher processing effort. Memory

[18] In the scope of this dissertation, I shorty describe the difference of the theories, but the overview cannot be exhaustive. For example, there are several different sub-theories within modular and interactive approaches. For a more comprehensive overview cf. Mitchell (1994) and Levy (2008).

capacity is one example of cognitive resources. Local ambiguities are resolved by choosing the structure that consumes the least resources.

In non-modular/interactive parsing models, the parser receives information from various linguistic domains to determine the structure and meaning of a sentence. The parser draws from semantics, discourse context, and frequency of words and syntactic structures. All these resources are active at the same time and provide the parser with information. This information constrains the number of alternative structures that arise in critical, ambiguous positions in the clause. Therefore, while perceiving a sentence, competing structures are activated in parallel, but their number is gradually reduced by integrating further information. If the possible candidates are reduced to the most plausible one, this structure is applied to the input. If, however, the structure turns out to be incorrect, alternative structures are activated. This means that alternatives are present in working memory but are inhibited by the system (cf. van Gompel & Pickering 2007: 292). Alternatives are ranked according to their plausibility. Levy (2008) refers to these models as "resource-allocation theories" because the parser "allocates different amounts of resources to different interpretations of the partial input" (Levy 2008: 1128). Problems arise when the parser inefficiently allocates these resources.

Both parsing theories have been supported by empirical evidence in psycholinguistic research[19], suggesting that the parser might be a hybrid of both. However, both models indicate that the parser faces problems if an initial analysis is incorrect, in other words when expectations are not met. Hence, expectations and surprisal seem to play a role in processing V2 and V3 structures.

4.1.2 Expectation and surprisal

A theory that deals with the role of expectation in sentence parsing is presented in Levy (2008). The *surprisal theory* (henceforth ST) is a modified version of *surprisal*, initially developed by Hale (2001). ST unifies "the idea of the work done [on] incremental probabilistic disambiguation with expectations about upcoming events" [sic] (Levy 2008: 1128). The theory assumes limited parallel parsing, i.e., not all possible structures are predicted, and it is neutral in terms of the exact representations of sentence structures.

What does surprisal mean in sentence processing? When humans encounter sentences, they develop linguistic representations during processing. Based on what has been given before,

[19] Evidence in favor of serial model comes from Hopf et al. (2003), Meng & Bader (2014), evidence for parallel parsers is provided by Mason et al. (2003), Hickok (1993), Pearlmutter & Mendelsohn (1999).

humans anticipate the next element and even parts of the sentence that occur later in the sentence. For example, if the parser detects a ditransitive verb following a subject, it expects two objects to occur somewhere in the clause. Based on experience, the parser develops and deduces probabilities, which indicate where in the sentence these elements are to be expected. If these expectations are met, integrating upcoming elements into the sentence structure is easier, leading, e.g., to faster reading times. In other words, there is a constant update of information after each word allowing for further predictions about which syntactic structure follows and where in the following syntagma constituents will most likely appear. This means that probabilities of the occurrence of structures and lexical items that seem plausible are constantly assigned and evaluated. Probabilities are achieved by distributing different amounts of cognitive resources to competing structures. The degree by which the update occurs can be quantified by the relative entropy of a probability distribution of q with respect to the probability distribution of p. For example, if the probability distribution of p equals the distribution p, the relative entropy is zero (if p = q, D(q||p) = 0). The greater the difference between p and q, the greater the relative entropy, which is reflected in surprisal. Put differently: A structure can turn out to be wrong, as is the case with *fell* in (59), and if this is the case, the relative entropy and thus surprisal are very high. This leads to difficulties in processing of this word, which in turn reflects in higher reading times.

Levy (2008: 1132) considers surprisal as the "difficulty incurred in replacing the old distribution with the new". In this respect, surprisal is interposed between a structural representation and comprehension difficulty, and it is surprisal that causes these difficulties rather than the structure itself. Consequently, surprisal functions as a bottleneck between linguistic representations and processing difficulty.

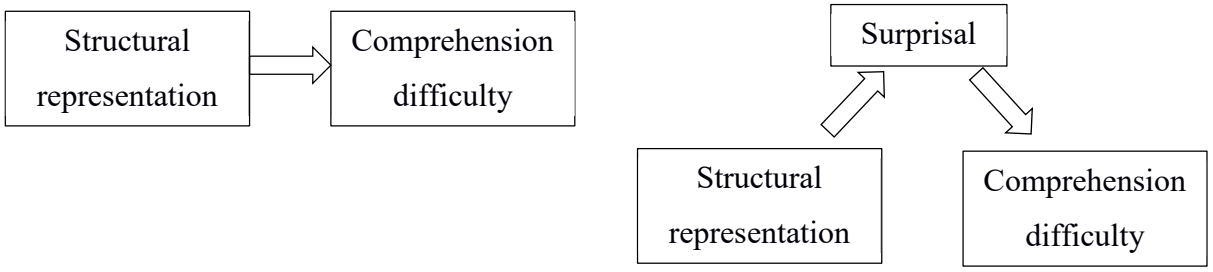


Figure 14: Direct effect of structural representation on processing (left) vs. surprisal as a bottleneck between structural representation and processing (right), Levy (2008: 1133).

In the case of Adv-S-V_{fin}, the parser might expect the verb after the initial adverbial. Since the second element is a subject, the linguistic information needs to be updated, and the presented structure deviates from the expectation. If this is the case, then the reading times on the second

element should be higher than the reading times on verbs in a V2 clause would be. More important for V3 is the fact that surprisal varies in its degree. For example, a non-verb in the second position is usually unexpected, but some elements are more expected than others. A subject, for example, could be more expected than an object in a particular context. This would then mean that the parser considers all the information available in order to apply an interpretation. According to Levy (2008), surprisal can be caused by any linguistic source, including syntax, morphology, phonology, and semantics. Other sources that the parser makes use of in parsing sentences is context and frequency.

4.1.3 Context

While Frazier (1979) assumes that the initial parsing decisions are based on syntactic information, Altmann & Steedman (1988) and Crain & Steedman (1985) argue that referential context favors certain parses, and hence guides the parser into a specific direction. Based on the literature, in chapter 3, I assumed that context is an important factor that plays a role in the acceptability of V2 and V3. The influence of contextual information on sentence processing has been investigated in several studies.

Weskott (2003) analyzes the processing of object- and subject-initial V2 declaratives embedded in different context scenarios. He explores three factors and their influence on the processing of the initial element: inferability of the initial constituent, the parallel structure of a preceding context sentence, and the impact of explicitly mentioned antecedents in the preceding context. Inferability refers to the fact that specific concepts are activated faster than others, given a specific context. For example, when describing a situation in a restaurant, *the waiter* is more inferable, and hence processed faster, than *the butcher*, because world knowledge states that events happening in the restaurant are most probably more related to the waiter than the butcher. Weskott (2003) finds that sentences were read faster if a specific element was inferable from the context compared to when it was not inferable from the context. However, since Weskott (2003) did not find an interaction of inferability and word order, inferability itself does not facilitate the reading times on the objects in object-initial V2 sentences. The second factor, parallel structure of the preceding context, refers to parallelism in form and content of preceding sentences. Contexts are parallel if several preceding sentences are object-initial V2, and all of the objects stand in the same discourse relation to the sentence topic, e.g., in a posit-relation. Weskott (2003) did not find that objects profited more from parallel structure than subjects. Thus, the effect is equally strong for both structures, and parallel

context does not interact with word order. Lastly, explicitly mentioned antecedents did facilitate the reading times on objects more than they did on subjects. Hence, objects profited from preceding explicit antecedents, as also reported in Bader et al. (2017). To summarize, Weskott (2003: 112) finds that the subject-first preference is powerful and can only be overridden by "relatively strong contextual factors".

Context licensing conditions in the processing of V2 have also been investigated by Weskott et al. (2011). The authors present data from a self-paced reading experiment in which they confronted participants with SVO and OVS structures in a null context and a whole-part context, i.e., contexts in which the antecedent was mentioned. They find that in the null context, reading times between SVO and OVS did not differ. However, OVS was processed faster than SVO when the object was in a whole-part relation to a referent of the preceding context. Hence, whole-part contexts had a licensing effect on OVS structures.

Similar results are reported in Skopeteas & Fanselow (2009). In a picture description task, Skopeteas & Fanselow (2009) investigate the influence of the discourse status of the arguments on word order. Participants were asked to describe a picture after they had been introduced to either the agent or the patient in other pictures before. When the agent was presented to the participants, they exclusively produced agent-first structures; but when the participants saw the patient, they put the agent in the prefield in only 77% of the instances. In 23%, they put the patient first, using passive voice.

In a series of studies, Bader et al. (2017) address the effect of thematic roles, animacy, and discourse status on prefield filling in German. The authors present findings from a constrained production task, a picture description task without context, and a picture description task in which the context established the object as the topic. As mentioned before, they found that animate objects that are patients or experiencers tend to be fronted under three conditions: 1) the subject of the sentence is inanimate, 2) the object is an experiencer, or 3) the object is made topic by contextual information. Additionally, corpus data presented in Bader at al. (2017) reveal that initial objects are rarely realized as personal pronouns in the prefield; instead, they appear as d-pronouns or demonstrative NPs. Overall, according to Bader et al. (2017), motivating a topical object had a much stronger effect than the lexical-semantic properties of the arguments of the verb.[20]

[20] Even though Bader et al. (2017) found that context has a stronger influence than lexical-semantic properties it should be noted that also these properties have been reported to affect the processing of initial element. Verhoeven (2014) investigates the filling of the German prefield with subject-experiencer and object-experiencer verbs and the effects of animacy and thematic roles of the stimulus. Following the methodology in Ferreira (1994), participants were asked to produce sentences with given verbs and two nouns. Subject-experiencer verbs preferred

4.1.4 Frequency

MacDonald et al. (1995) state that frequencies of occurrences as well as the co-occurrence of different types of information impact processing. The linguistic tuning hypothesis states that "structural ambiguities are initially resolved on the basis of stored records relating to the prevalence of the resolution of comparable ambiguities in the past." (Mitchell et al. 1995: 470). Thus, if a structure has been proven to solve an ambiguity in the past several times, this structure will be used to resolve similar ambiguities. One might then conclude that more frequent structures are processed faster. Mitchell et al. (1995) distinguish between fine-grained information, which is the frequency with which words appear in specific structures, and coarse-grained information, which is the frequency of structures themselves. Empirical evidence supporting the fact that frequency is a highly relevant factor for parsing sentence structures comes from relative clause attachment:

(62) a. The journalist interviewed the daughter of the colonel who had the accident.
b. El periodista entrevisto a la hija del coronel que tuvo el accidente.
(Cuetos & Mitchell: 1988: 35)

In (62), the relative clause *who had the accident* is preferably attached to the low DP *the colonel* while high attachment to *the daughter* is also possible. In Spanish (62) on the other hand, *que tuvo el accidente* is preferably attached high to *la hija*. Mitchell et al. (1995) argue that the difference is due to the frequency difference between high and low attachment in both languages. In English, low attachment is more frequent, while in Spanish high attachment is more frequent.

Structural ambiguities can also be resolved according to the lexical frequency of co-occurring constituents (fine-grained information). For example, if the parser encounters the transitive verb in a subject-initial V2 sentence, the parser might expect a direct object to follow. However, some verbs also precede a CP as their complement, as in (63).

(63) a. The journalist confirmed the rumor about his death.
b. The journalist confirmed the rumor was true. (Lee & Watson 2012: 392)

Studies show that reading times are increased if a CP instead of an NP follows the verb in sentences like (63), indicating that processing is guided by co-occurring frequencies (cf. Trueswell et al. 1993, Garnsey et al. 1997, Mitchell & Holmes 1985). For V3, frequency could

initial subjects with animate and inanimate objects and the active voice, whereas object-experiencer verbs preferred initial objects. This preference was even stronger more with inanimate noun-stimuli. Object-initial sentences were produced using non-canonical verb forms such as passive and anti-causative constructions.

lead to differences in reading times between Adv-S-V_{fin} and Adv-O-V_{fin}. Even though Adv-S-V_{fin} is rare, it nevertheless occurs more frequently than the unattested Adv-O-V_{fin} structure. Hence, reading times should be lower for Adv-S-V_{fin}. This holds for the overall structure (coarse-grained frequency) but also for constituent orders (fine-grained frequency). Adverbials that are followed by a subject are more frequent than adverbials that are followed by an object. However, adverbials that are followed by a verb constitute the most frequent declaratives, and hence these structures should be read faster than V3. On the other hand, an interesting question is how the verb in Adv-S-V_{fin} and S-V2 is being read in comparison to the verb in Adv-O-V_{fin} and O-V2. In both cases, the verb occurs after the preverbal constituent with the same frequency, and therefore we should expect no differences in the reading times at the verb in Adv-S-V_{fin} and S-V2 and in Adv-O-V_{fin} and O-V2. I will motivate the predictions concerning the processing of these regions in detail in section 4.3.1.

4.1.5 Processing preverbal and verbal information

As highlighted in chapter 3, languages seem to exhibit a strong subject-first preference in terms of acceptability. This also holds for sentence processing. For German, Hemforth (1993) and Hemforth et al. (1993) observe that in sentences with a case ambiguous initial constituent, the second NP in the clause displays high reading times if this second NP cannot be interpreted as the direct object. Hence, the initial, ambiguous NP is, by default, interpreted as the subject. Objects displayed longer reading times in the initial position compared to subjects. Schlesewsky et al. (2000) observe the same preference for wh-structures. Gieseking (2000) argues that frequency is one of the main factors that trigger the subject-first preference.

Generally, subject-initial V2 seems to have a special status in sentence processing. In subject-initial V2, the subject precedes the verb with which it stands in an agreement relation. Thus, processing the subject evokes predictions about the grammatical properties of the verb. Weyerts et al. (2002) show that this particular relationship is so strong that it even overrides grammaticality. In a series of studies, the authors test the processing of the following structures:

(64) a. *Main clause with correct SV_fO word order*
Hans facht das Lagerfeuer an, und Paul *öffnet die Dosen.*
b. *Main clause with incorrect SOV_fword order*
*Hans facht das Lagerfeuer an, und Paul *die Dosen öffnet.*
c. *Embedded clause with correct SOV_fword order*
Die Leiterin des Kochkurses bestimmt, dass Erika *die Dosen öffnet*
d. *Embedded clause with incorrect SV_fO word order*
*Die Leiterin des Kochkurses bestimmt, dass Erika *öffnet die Dosen.*

They found that "incorrect" main clauses were read significantly slower than "correct" main clauses but that "incorrect" embedded clauses were not read significantly slower than "correct" embedded clauses. They conclude that "the effect of ungrammaticality (which should lead to longer reading times) is canceled out by the fact that a SOV_f pattern was replaced by SV_fO, which made it possible to parse the finite verb at its preferred post-subject position." (Weyerts et al. 2002: 223). While in SVO the subject is adjacent to the verb and agreement features can be matched right away, in SOV structures, the agreement information needs to be stored in working memory, which increases processing load. The authors show that the effects are also visible in ERPs. Assuming that the lacking adjacent configuration of subject and verb leads to processing difficulties is in line with an incremental parsing hypothesis.

The role of the verb in sentence processing has been explored primarily with respect to the assignment of thematic roles. Bornkessel (2002) and Schlesewsky & Bornkessel (2004) investigate whether subject-before-object orders are preferred with agentive verbs (e.g., *drohen*) over object-before-subject readings, which might be preferred with experiencer verbs (e.g., *gefallen*). They found a minor effect but conclude that verb-specific information does not contribute to establishing thematic relations. Temme & Verhoeven (2016), on the other hand, found that objects are preferred in the initial position with sentences that have experiencer-object verbs. However, as mentioned earlier, Bader et al. (2017) find that context has a much more substantial impact on word order than lexical-semantic information.

Taking a generative perspective, if the verb plays a role in processing arguments, then one might assume that processing effects should be visible in the base position. Under a strict incremental hypothesis of sentence comprehension, verbal information is interpreted as soon as the recipient encounters the verb. At this point in processing, the verb projects grammatical information such as thematic roles to arguments, and thus it evokes expectations about specific arguments to come. Consequently, reading times on the finite verb that distributes argument related information is expected to be high. However, there is evidence that thematic information is being integrated at a very late point in a sentence (cf. Freitag 2019). If this is the case, verbs in the second position should be read comparatively fast, since the parser only assigns thematic roles at a later point in the clause, i.e., in the clause-final position where the verb is base-generated. Freitag (2019: 135) concludes that high reading times at the end of the clause is unexpected in incremental processing. Rather, such reading time observations are in accordance with the V2-Reconstruction Hypothesis. The V2-Reconstruction Hypothesis states that the verb is moved into the second position in a V2 language, but "its lexical part is evaluated in its base

position, i.e., in German in clause-final position" (Bayer & Freitag 2020: 79). In several self-paced reading experiments, Freitag (2019) provides empirical evidence that verbs are base-generated in the final position, and it is that position that is used in order to assign thematic roles to the complements. For this dissertation, one of the experiments is particularly interesting. In experiment 5, Freitag (2019: 178ff.) investigates verb reconstruction and word order preferences. He states that in sentences with an experiencer-object verb, the subject-first preference stands in conflict with the experiencer-first preference, which would prefer an object in the first position with experiencer-object verbs. In strict incremental models, Freitag (2019: 179) assumes, "information about the thematic roles should decrease the subject-first preference for experiencer-object verbs immediately after the encounter of the lexical verb". In the V2-Reconstruction Hypothesis, information about thematic roles is always assigned at the base position of the verb, and the preceding elements will make use of a default interpretation. Thus, effects should be visible at the base position of the verb. The experiment conducted by Freitag (2019) supports the V2-Reconstruction-Hypothesis. However, higher reading times at the end of a clause, i.e., the base position of the clause, can be caused by a clause-final wrap-up effect, mentioned earlier in section 3.3.2. Being aware of that fact, Freitag (2019: 142) argues that "this effect may mask verb-specific processes".

4.2 Implications for the processing of V3

To summarize, the studies reported above deal with six crucial aspects that need to be considered when investigating the processing of V3 sentences and modeling their grammar: the architecture of the parser, expectation and surprisal, context, frequency, and processing preverbal and verbal information. These factors have the following implications for the processing of V3:

1. The parser can potentially follow two strategies in syntactic analyses. First, it follows only one syntactic analysis until it encounters a position that is not compatible with the expectation. In this case, the parser re-analyzes the structure. Second, the parser computes multiple competing structures in parallel, drawing from contextual, semantic, and lexical information. In ambiguous positions in a clause, the parser re-ranks these candidates and applies the most probable structure considering evidence from the input. The ambiguous position in Adv-S-V_{fin} is the preverbal constituent, and therefore effects should occur on the second constituent.
2. Contexts are extremely important for the interpretation of V2 and V3. Contexts exhibiting an antecedence that is identical to the topicalized object in the following sentence facilitate the reading time of this object. Otherwise, the subject-first preference in sentence processing is so strong that non-subject-initial constituents automatically exhibit higher reading times.

3. More frequent structures are processed faster and this also accounts for frequently co-occurring constituents.
4. Verbal information is either immediately retrieved as soon as the verb occurs or information in terms of thematic role and case are assigned to the arguments at the base position of the verb. Effects occur either at the base position of the verb or immediately on unexpected constituents.

All of these aspects influence reading times of the preverbal area, the verb, and the postverbal area in V3 sentences. In the next section, I present a self-paced reading study and provide an interpretation of the data with respect to the question as to what the experiment can reveal about the status of V3 in German.

4.3 V2 and V3 in sentence processing

In this study, I explore the status of V3 from the perspective of sentence processing. I compare Adv-S-V_{fin} with Adv-O-V_{fin} and V2 sentences in order to account for a detailed analysis of V3 drawing on previous studies concerning prefield processing and processing of the verb. For this purpose, I conducted a self-paced reading experiment in which I tested whether V3 and V2 structures differ in reading times in different regions of interest. Many studies have provided valuable insights into the processing of object-initial and subject-initial V2 declaratives. However, to the best of my knowledge, no research has been conducted concerning the processing of adverbial-initial clauses in contrast to subject-initial or object-initial V2. Understanding the processing of the preverbal adverbial is essential in Adv-S-V_{fin} sentences because it constitutes the initial constituent and is part of the preverbal area in V3. The reason why no research has been done in the area of preverbal adverbials might be due to the different statuses of adverbials and non-adverbials. Subjects and objects are arguments of the verb, which assigns thematical roles and case to both. For adverbials, the situation is rather different: The semantic class of the adverbial determines the degree to which adverbials depend on the verb. As mentioned earlier, modal adverbials are related to the verb or the VP, temporal and local adverbials are related to the overall structure. Furthermore, the semantic class determines the position of an adverbial in the clause, and in the generative literature, there has been a major discussion whether adverbials freely adjoin or move to specific positions in the structure. However, as the previous sections have shown, initial adverbials are preferred in specific contextual and communicative settings, similar to initial objects.

In addition, and less surprisingly, there is no study focusing on the processing of V3. The present study aims to answer the following three questions to shed light on the status of V3 from the perspective of sentence processing:

1. Does Adv-S-V_{fin} differ from Adv-O-V_{fin} in processing?
2. Which role does verb placement play in sentence processing?
3. Which role do the preverbal constituents play in sentence processing?

The rationale behind these questions is the following: If Adv-S-V_{fin} and Adv-O-V_{fin} evoke similar processing difficulties, then this could be due to placing the verb in the third position. Hence, the V2 constraint in German is so strong that it applies in all cases and rejects structures that are not V2. This rejection should occur in the second position, i.e., at the subject or the object, because after the adverbial, a verb is the only possible element in declaratives under the V2 constraint. There should be no difference in reading times on these elements because both should be similarly difficult to integrate into the structure.

In investigating the processing of V2 and V3, I first observe the reading times (henceforth RTs) of the overall structures. In addition, I investigate whether the semantic class of the adverbial has an impact on the overall RTs since the adverbial in Adv-S-V_{fin} is reported to occur in various semantic classes. However, one of the functions of the initial adverbial is that of a frame-setter, for which temporal and local adverbials are reported to be prototypical candidates. Second, I observe the RTs in the critical regions in the different conditions. The regions of interest are the preverbal region and the verb region. However, to provide a comprehensive overview of the data, I also explore the other regions, since in previous studies, it has been shown that effects might occur later in the clause. This is particularly true for the spill-over region introduced in chapter 3. For all regions, I observe whether the semantic class of the adverbial affects the RTs. In the next section, I provide predictions concerning the processing of the overall RTs as well as of the individual regions.

4.3.1 Predictions

4.3.1.1 Overall reading times

For the overall processing of V3, I expect the following: Adv-O-V_{fin} sentences are processed slower than Adv-S-V_{fin}. The assumption draws on findings concerning the frequency in language use of V3. Adv-S-V_{fin} sequences are used by speakers, whereas Adv-O-V_{fin} is not, and objects do not occur in the second position. This indicates that Adv-O-V_{fin} does not fulfill the necessary informational-structural and functional requirements that license the usage of these structures. This should lead to higher RTs for unattested Adv-O-V_{fin}. The RTs of the Adv-S-V_{fin} structures should be lower than those of the Adv-O-V_{fin} sentences because they occur in everyday language use and are related to a specific function. Overall, V3 should be read slower

than V2 since the structure is less frequent, and the parser expects a verb after reading a non-verbal preverbal constituent. I expect temporal and local adverbials to lead to faster RTs than modal adverbials in Adv-S-V_{fin} since these adverbials can, in contrast to modal adverbials, function as prototypical frame-setters. Also, these adverbials are more frequent in Adv-S-V_{fin}.

For the overall processing of V2, I expect no difference between the RTs of S-V2 and O-V2 because the context sentences provided should allow for both structures. Since there is, to the best of my knowledge, no research dedicated to S-V2, O-V2, and A-V2 in comparison to each other, no predictions can be made based on the literature. The experimental stimuli, however, allow for both subject-initial and object-initial V2. The effectiveness of the stimuli was supported by the acceptability judgment task, where both structures were rated similarly acceptable. Generally, in the overall processing, there should be no difference in V2 processing, since the parser applies certain structural analyses to the sentences that are allowed by the context. Thus, the parser should compensate for differences in the processing of the different regions. The predictions for the overall RTs are summarized in (P1a – P1d).

(P1a) Overall, Adv-S-V_{fin} is read faster than Adv-Obj-V_{fin}.
(Adv-S-V_{fin} < Adv-Obj-V_{fin})

(P1b) Overall, V2 is read faster than V3.
(V2 < V3)

(P1c) Overall, temporal and local adverbials lead to faster RT in Adv-S-V_{fin}.
($Adv_{temp/loc}$-S-V_{fin} < Adv_{mod}-S-V_{fin})

(P1d) Overall, there are no differences between the RTs of the V2 sentences.
(S-V2 = A-V2 = O-V2)

4.3.1.2 Regions of interest

Concerning the individual regions in all conditions, I expect the following for Adv-X-V_{fin}: In the first position, no differences in the RTs should occur between Adv-S-V_{fin} and Adv-O-V_{fin}, because at this point, both structures are equally ambiguous. For the second element, I expect one of the following two processing mechanisms: Either the RTs of the preverbal constituent are equally high for both structures or subjects are read faster than objects. In the first case, the German V2 constraint is so strong that the parser does not differentiate between elements that follow the adverbial. Note that the context sentence preceding each target sentence allows for familiar/aboutness topics in Adv-S-V_{fin} and contrastive topics in Adv-O-V_{fin}. Hence, context itself should not rule out either of the structures. However, whenever the second element is not a verb RTs increase.

In the second case, the parser draws conclusions from frequency and expectation due to the mental representations of Adv-S-V_{fin}. If this is the case, subjects in Adv-S-V_{fin} should be read faster than objects in Adv-O-V_{fin}. Corpus studies and the acceptability judgment task strongly suggest that Adv-S-V_{fin} is represented as a structure in grammar while Adv-O-V_{fin} is not. Therefore, I expect the latter scenario to be the case: The subject in Adv-S-V_{fin} is read faster than the object in Adv-O-V_{fin} due to language use, expectation, and frequency.

A similar argument applies to the verb position in the V3 structures. There should be no difference in processing the verb in both structures since the parser has difficulties in processing the verb whenever it is not in the second position in a declarative. However, if Adv-S-V_{fin} has a representation in grammar, then the verb is expected to appear after the subject in Adv-S-V_{fin}. Hence, the verb should be read faster in comparison to the verb in Adv-O-V_{fin}. The predictions are summarized in (P2a – P2c).

(P2a) In the initial position, Adv-S-V_{fin} does not differ from Adv-O-V_{fin}.
(Initial $pos_{Adv\text{-}S\text{-}Vfin}$ = Initial $pos_{Adv\text{-}Obj\text{-}Vfin}$)

(P2b) In the preverbal position, Adv-S-V_{fin} is processed faster than Adv-O-V_{fin}
(Second $pos_{Adv\text{-}S\text{-}Vfin}$ < Second $pos_{Adv\text{-}Obj\text{-}Vfin}$)

(P2c) In the verb position, Adv-S-V_{fin} is processed faster than Adv-O-V_{fin}
(verb $pos_{Adv\text{-}S\text{-}Vfin}$ < verb $pos_{Adv\text{-}Obj\text{-}Vfin}$)

In addition, I expect an influence of the semantics of the adverbial on the second element in Adv-S-V_{fin} because temporal and local adverbials are reported to be preferred in Adv-S-V_{fin}. Suppose that from the second position onwards, the parser analyzes Adv-S-V_{fin} as a structure that has a structural and functional representation. In that case, the effects for temporal and local adverbial should occur in the second position because the parser computes the Adv-S-V_{fin} structure based on the additional information that the first adverbial could be a frame-setter. Modal adverbials are not typical frame-setters, and thus they should not affect the RTs of the preverbal subject in Adv-S-V_{fin}. No effect of the semantic class of the adverbial is expected for the object in Adv-O-V_{fin} since these structures are not preferred by specific adverbial classes as it the case for Adv-S-V_{fin}. The predictions are summarized in (P3a – P3b).

(P3a) Temporal and local adverbials lead to faster reading of the subject in Adv-S-V_{fin}, but modal adverbials do not.
($Adv_{temp/loc}$-S-V_{fin} < Adv_{mod}-S-V_{fin})

(P3b) The semantic class of the adverbial does not affect the RTs on the object in Adv-O-V_{fin} sentences.

4.3.1.3 V3 versus V2 processing

For the processing of V3 in comparison to V2, there are two possible scenarios: In the first scenario, in V3 sentences, the parser encounters difficulties on the second element because the parser rather expects a verb. After having passed this critical region, the parser analyzes the structure as a V2 structure. It considers the initial adverbial and its semantic information but proceeds with V2 processing strategies, i.e., the subject-first preference for preverbal subjects and the context licensing for preverbal objects. RTs on the second element (i.e., the subject or the object) increase and are higher than the initial element in V2, due to surprisal. Both V3 structures should then be processed similarly to their V2 counterparts, but the V3 structures should be processed slower than any of the V2 sentences. In the second scenario, the parser follows another strategy in processing Adv-S-V_{fin} because it detects a structurally and functionally different clause than in the case of V2. RTs should then be different for Adv-S-V_{fin} compared to the matching S-V_{fin} sequence in subject-initial V2.

Having spelled out the necessary rationale and predictions concerning the experiment, we now turn to the methods, results, and discussion of the findings.

4.3.2 Methods

The experiment made use of the moving-window technique (Just et al. 1982), i.e., participants were asked to read the sentence in a word-by-word fashion. First, they saw sentences in which the words were dashed out, each dash representing a letter. By pressing the space bar, only the first word appeared. Pressing the space bar for the second time revealed the second word and dashed out the preceding word. In this way, participants read the sentences only one word at a time. RTs were measured after pressing the space bar. Apart from the combination determiner + noun, each word was presented separately.

4.3.2.1 Participants

30 participants, all students at the University of Potsdam and monolingual speakers of German, took part in the experiment (23 female, 7 male; average age: 28, SD: 5.67). One participant was excluded due to the high exposure to Albanian as a child. The participants were paid €5.00 or 0.5 credits as compensation for taking part in the experiment.

4.3.2.2 Stimuli

The stimuli matched the stimuli used in the acceptability judgment task. The studies mentioned above show that similar to acceptability judgment tasks, specific contexts can facilitate processing. For that reason, it was highly important in the self-paced reading experiment to provide the stimuli with context sentences. The context sentences in the acceptability judgment task included an explicitly mentioned antecedent and allowed for topicalized objects in V2 declaratives. It also allowed for familiar topics in Adv-S-V_{fin}. Identical stimuli were used in both experiments.

4.3.2.3 Procedure

The experiment was run on a laptop using the software LINGER (version 2.88, developed by Doug Rohde). The participants were asked to sit in front of the laptop and were verbally introduced to the task by the instructor using the same scripted instruction for each participant. In the second step of the experiment, the participant read the instructions on the screen, which ended with a summary that highlighted the most important key facts, such as silently reading each sentence carefully and as naturally as possible. After that, a pretest phase consisting of five test items started. Participants were allowed to ask questions until the end of the pretest phase. After the participants completed the pretest phase, they started the experimental phase.

In both the pretest and the test phase, 25% of the items were followed by a question asking about the content of the sentence. All participants were asked to answer this question by pressing the green ("yes") or the red ("no") key on the keyboard. The answers were automatically evaluated, and the participants got immediate feedback on their answers ("Correct" or "Wrong"). Questions were not asked after each sentence in order to keep the experiment below 40 minutes to ensure that the participants stayed focused throughout the whole experiment. One session included eight breaks and lasted about 35 minutes. After the experiment, participants were asked to guess the purpose of the study and provide information about knowledge of other languages, including a self-assessment concerning their proficiency in these languages on a scale from 1 (very little knowledge) to 10 (very proficient). No participant provided a correct prediction and English was reported by each participant with an average rating of 7.7 (SD=1.2).

4.3.2.4 Data analysis

Prior to the analysis, reading times below 200 ms were excluded from the data following, among many others, Whelan (2008), Jegerski (2014), Baayen & Milin (2015). Since the words differed in length, residual RTs were computed for each participant (cf. Ferreira & Clifton 1986, Trueswell et al. 1994). An additional advantage of this approach is that individual variation between participants is considered in the analysis. Hence, it "cancels out individual differences of speed between the participants" (Marinis 2010: 149). Residual RTs of 3 standard deviations above the mean were excluded as well as sentences that preceded wrong answers to the content questions. This process led to a loss of 2.5% of the data.

The data were analyzed in a linear mixed model in R (R Core Team 2015) using the lme4 package (Bates et al. 2015) and the multcomp package (Hothorn et al. 2013) to obtain p values with Holm adjustments for multiple comparisons. The maximal model contained condition as a fixed effect and random intercepts and random slopes for items and participants. The model was fitted by subsequently eliminating random slopes and comparing the limited models with the maximal model. A log-likelihood ratio test revealed that the exclusion of random slopes for participants and items did not provide a better fit to the data. For that reason, I adopted the minimal model. For consistency, the same model was applied to all regions of interest.

4.3.3 Results

For reasons of clarity and comprehensibility, the results are visualized in milliseconds. For the statistical analysis, however, residual RTs were used. For consistency with the data from the acceptability judgment task and in order to provide a more straightforward presentation of the data, I apply the same abbreviations for the structures as in the acceptability judgment task, i.e., Adv-S-V_{fin} = AS-V3, and Adv-O-V_{fin} = AO-V3.

4.3.3.1 Overall reading times

The overall reading times for all regions, including the spill-over regions four and five, revealed that AO-V3 sentences were read slower than all the other structures (2659.99 ms). AS-V3, A-V2, and S-V2 were similar in reading times (AS-V3: 2574.14 ms, A-V2 2574.41 ms, S-V2: 2569.06 ms). O-V2 was read slightly slower than the other V2 structures and AS-V3. Table 11 illustrates the reading times for each condition.

Condition	RT in ms
AO-V3	2659.99
AS-V3	2574.14
A-V2	2574.41
O-V2	2608.59
S-V2	2569.06

Table 11: Collapsed mean reading times of all conditions (regions 0 – 5).

A log-likelihood ratio test revealed no effect for semantic class ($\chi^2(2) = 1.3076$, $p > 0.5$). Therefore, this factor was not included in further analyses. A significant effect of the different word order conditions was found, namely that AO-V3 was read significantly slower than AS-V3 ($p < 0.005$), A-V2 ($p < 0.002$), and S-V2 ($p < 0.007$). There was no significant difference between AO-V3 and O-V2 ($p > 0.1$). The complete output is given in Table 12. Multiple comparisons revealed no other significant differences between the conditions (see Table 13).

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Sum0.5Resid ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-39.44	47.21	69.77	-0.835	0.40633
AS-V3	-84.10	29.73	1058.21	-2.829	0.00476 **
A-V2	-93.73	29.70	1059.56	-3.156	0.00164 **
O-V2	-48.22	30.00	1059.55	-1.608	0.10819
S-V2	-83.35	30.66	1061.37	-2.719	0.00666 **

Table 12: Output of the linear mixed model for the overall reading times of all conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Sum0.5Resid ~ Condition + (1|ItemNr) + (1| SubjectNr))					
		Estimate	Std. Error	z value	Pr(>|z|)
V3 comparisons	AS-V3 – AO-V3	-84.1010	29.7308	-2.829	0.0421 *
V2 vs. AO-V3	A-V2 – AO-V3	-93.7297	29.6961	-3.156	0.0160 *
	O-V2 – AO-V3	-48.2243	29.9950	-1.608	0.7552
	S-V2 – AO-V3	-83.3493	30.6580	-2.719	0.0524 .
V2 vs. AS-V3	A-V2 – AS-V3	-9.6287	29.5600	-0.326	1.0000
	O-V2 - AS-V3	35.8767	29.8230	1.203	1.0000
	S-V2 - AS-V3	0.7517	30.5686	0.025	1.0000
V2 comparisons	O-V2 - A-V2	45.5054	29.7443	1.530	0.7563
	S-V2 - A-V2	10.3803	30.5736	0.340	1.0000
	S-V2 - O-V2	-35.1250	30.8234	-1.140	1.0000
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 13: Output of the linear mixed model for pairwise comparisons of the overall reading times in each condition.

In order to expound the factors that impact reading times, I conducted another model, replacing Condition with Preverbal Element (PreverbalE) and Verb position (Verbpos) as

factors. No effect was found for Verb position (p>0.25), but an effect was found for preverbal objects (β=57.511, SE=27.826, t=2.067, p < 0.03899), indicating that sentences with preverbal objects were read slower than sentences with other preverbal elements. The findings are summarized in Figure 15.

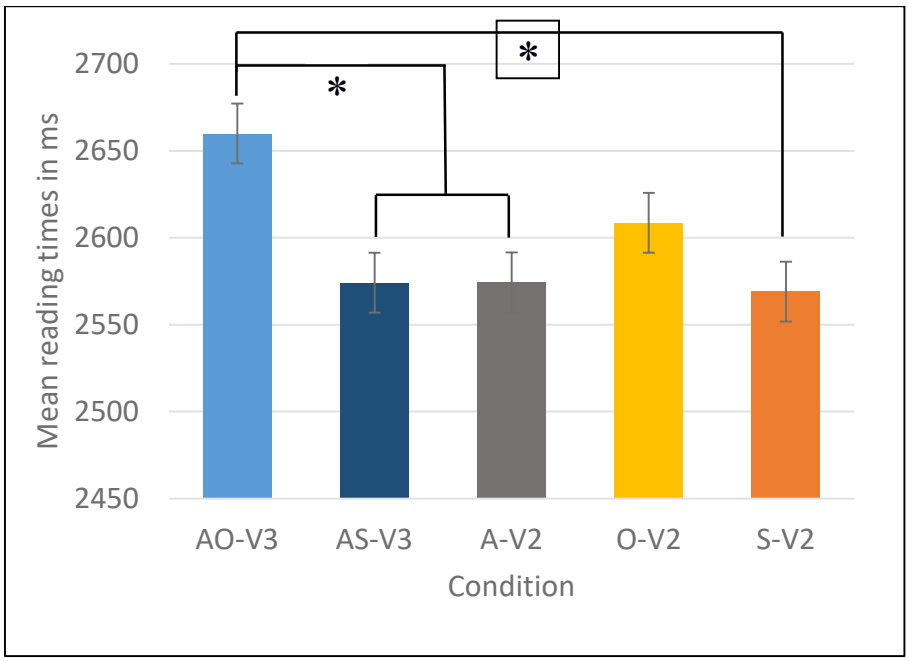


Figure 15: Overall mean reading times for all conditions in the SPR experiment, including the spill-over area with significant effects.

The overall RTs excluding the spill-over area changed the picture slightly, indicating that some effects occur in the spill-over area rather than in the critical area. This is the case for sentences with preverbal objects. Again, AO-V3 sentences displayed the highest RT (1713.25 ms). Meanwhile, S-V2 displayed the shortest RT (1595.81 ms), non-subject-initial V2 and AS-V3 are read similarly slower than S-V2 but faster than AO-V3 (AS-V3: 1638.97 ms, A-V2: 1612.87 ms, O-V2: 1638.65 ms).

Condition	RTs in ms
AO-V3	1713.25
AS-V3	1638.97
A-V2	1621.87
O-V2	1638.65
S-V2	1595.81

Table 14: Collapsed mean reading times of all conditions (regions 0 – 3).

A log-likelihood ratio test revealed no effect for semantic class ($\chi^2(2) = 1.083$, $p > 0.6$). Therefore, this factor was not included in further analyses. Significant effects were found for

AO-V3 in comparison to all other conditions, as illustrated in Table 15. Multiple comparisons did not reveal any other significant effects, as indicated in Table 16.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Sum0.3Resid ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-113.75	31.56	89.02	-3.605	0.000515 ***
AS-V3	-75.09	19.53	1057.16	-3.845	0.000128 ***
A-V2	-93.02	19.51	1058.62	-4.768	2.12e-06 ***
O-V2	-68.95	19.71	1058.39	-3.499	0.000487 ***
S-V2	-111.13	20.14	1059.96	-5.517	4.34e-08 ***

Table 15: Output of the linear mixed model for the overall residual RTs of the critical regions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Sum0.3Resid ~ Condition + (1|ItemNr) + (1| SubjectNr))					
		Estimate	Std. Error	z value	Pr(>|z|)
V3 comparisons	AS-V3 – AO-V3	-75.095	19.532	-3.845	0.000966 ***
V2 vs. AO-V3	A-V2 – AO-V3	-93.024	19.509	-4.768	1.67e-05 ***
	O-V2 – AO-V3	-68.954	19.707	-3.499	0.003270 **
	S-V2 – AO-V3	-111.128	20.144	-5.517	3.46e-07 ***
V2 vs. AS-V3	A-V2 – AS-V3	-17.929	19.421	-0.923	1.000000
	O-V2 - AS-V3	6.141	19.591	0.313	1.000000
	S-V2 - AS-V3	-36.033	20.093	-1.793	0.364603
V2 comparisons	O-V2 - A-V2	24.070	19.544	1.232	0.872379
	S-V2 - A-V2	-18.104	20.097	-0.901	1.000000
	S-V2 - O-V2	-42.174	20.260	-2.082	0.224252
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 16: Output of the linear mixed model for pairwise comparisons of the overall reading times of the critical regions.

The model that included PreverbalE and Verbpos as factors instead of Condition revealed a significant effect of the verb being third, indicating that verb-third sentences were read significantly slower than verb-second sentences (β=52.81, SE=14.05, t=3.759, $p < 0.0002$). There was marginal effect for preverbal objects (β=32.14, SE=18.28, t=1.758, $p < 0.079$). Figure 16 summarizes the findings.

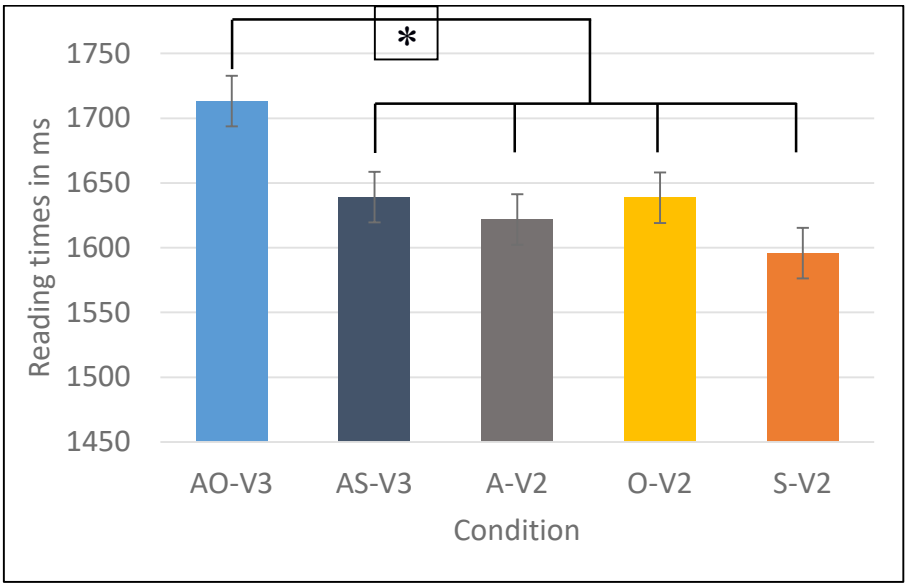


Figure 16: Overall mean reading times for all conditions in the SPR experiment, excluding the spill-over area.

4.3.3.2 Positional reading times

Figure 17 and Figure 18 show the RTs in each position with RTs in ms and residual RTs. The latter was used in the statistical analyses. I conducted separate analyses for V3 and V2 structures in the critical regions 0 – 3 and combined analysis for the V2 and V3 conditions in the spill-over area. Lastly, I compared the RTs of the verb position of all conditions.

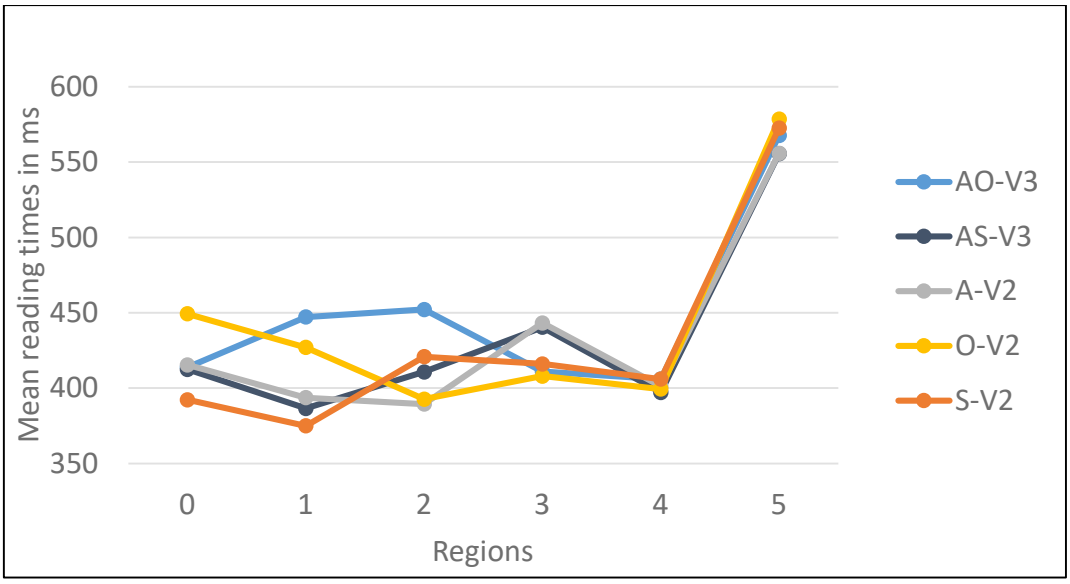


Figure 17: Mean reading times of all regions in each condition.

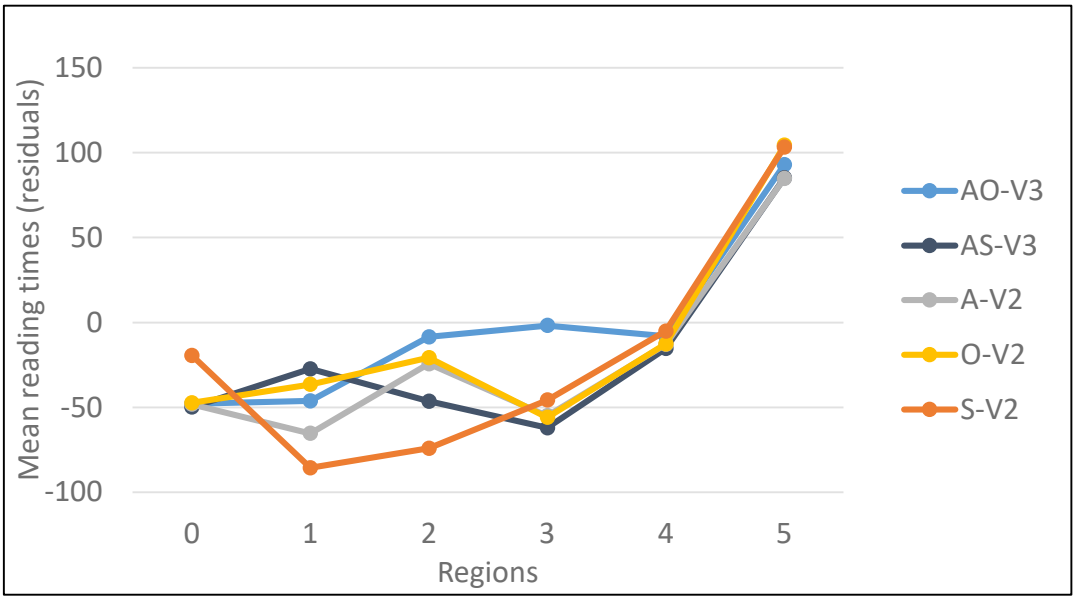


Figure 18: Mean residuals reading times of all regions in each condition.

4.3.3.2.1 V3 sentences

The reading times of the different regions of the V3 sentences are illustrated in Figure 19 and Figure 20. Figure 19 shows the RTs in ms, while Figure 20 shows the residual RTs used for statistical analyses.

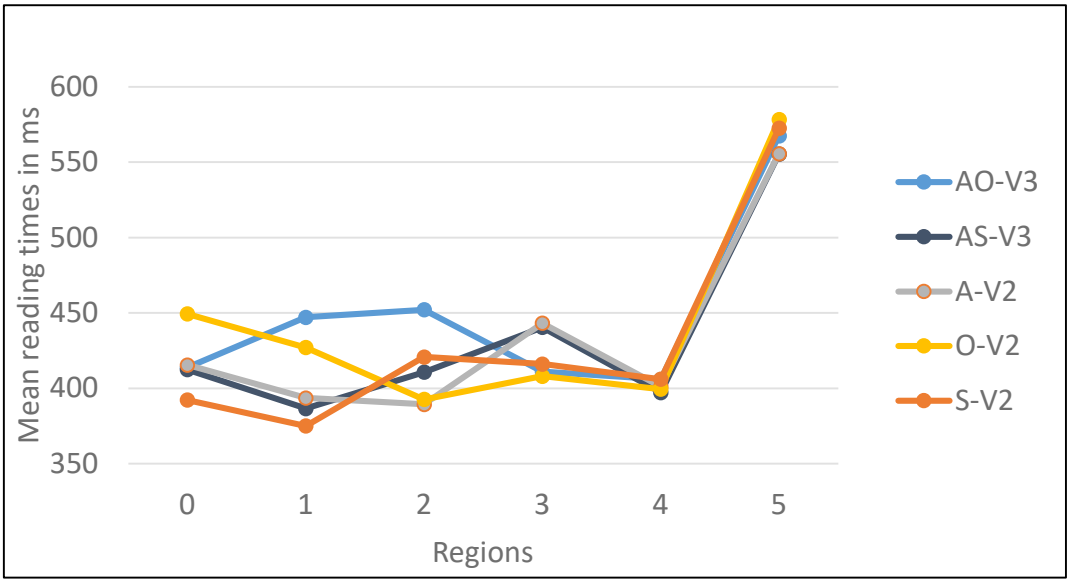


Figure 19: Mean reading times of all regions in the V3 conditions.

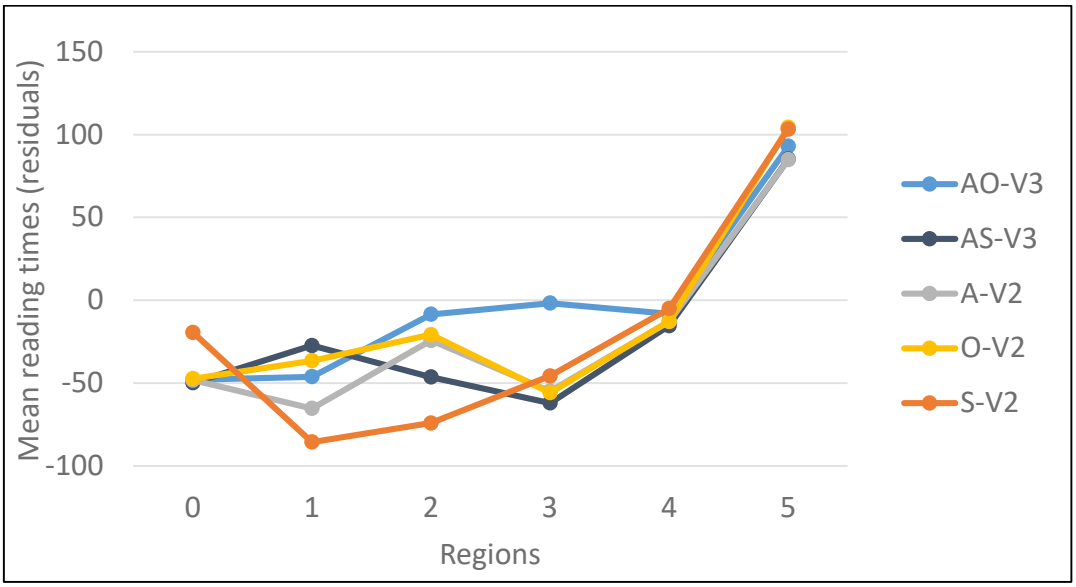


Figure 20: Mean residual reading times of all regions in the V3 conditions.

Region 0 – Initial adverbial Semantic class had no effect on RTs ($\chi^2(2)$ = 0.9924, $p > 0.6$). No effect of condition was found for the initial element (AO-V2 vs. AS-V3: β=-2.071, SE=6.665, t=-0.311, $p > 0.7$).

Region 1 – Preverbal element Since there was an effect of Semantic class on the preverbal element ($\chi^2(2)$ = 7.4946, $p < 0.03$), this factor was kept in the model for further analysis. The preverbal element was read faster when a temporal adverbial preceded it compared to residual RTs of the preverbal element with preceding local adverbials (β=-45.508, SE=17.508, t=-2.599, $p < 0.02$). Pairwise comparisons for the semantic class revealed that residual RTs on the preverbal elements were significantly faster with temporal adverbials than with modals or locals. The difference between temporal and local adverbials was less strong. No interaction of Semantic class and Condition was found. However, the subject in AS-V3 was read slower than the object in AO-V3. The findings are summarized in Table 17 and Table 18.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals~Condition + SemClass + (1|ItemNr) + (1|SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-27.870	14.510	64.981	-1.921	0.0591 .
AS-V3	18.540	9.176	430.121	2.020	0.0440 *
SemClass (modal)	-7.885	17.518	41.408	-0.450	0.6550
SemClass (temporal)	-45.508	17.508	41.238	-2.599	0.0129 *
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 17: Output of the linear mixed model for region 1 of all V3 conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr))				
	Estimate	Std. Error	z value	Pr(>|z|)
Modal - local	3.124	21.019	0.149	0.88184
Temporal - local	-58.200	20.867	-2.789	0.01057 *
Temporal - modal	-61.324	20.812	-2.947	0.00964 **
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)				

Table 18: Pairwise adjusted comparisons of the residual RTs of region 1 with initial temporal, local, or modal adverbials in the V3 conditions.

There was a marginal effect for Condition with the AS-V2 condition displaying longer reading times than the OS-V2 condition (β=18.540, SE=9.176, t=2.020, $p < 0.05$).

Region 2 – Verb Semantic class had no effect on RTs ($\chi^2(2) = 2.2786$, $p > 0.3$). There was a significant difference between AO-V3 and AS-V3 (β=-38.435, SE=8.119, t=-4.734, $p < 0.000$), with faster RTs on the verb in AS-V3 sentences.

Region 3 – Postverbal element Semantic class had no effect on RTs ($\chi^2(2) = 1.328$, $p < 0.5$). The postverbal element was read significantly faster in AS-V3 sentences than in AO-V3 sentences (β=-59.672, SE=8.601, t=-6.938, $p < 0.000$).

4.3.3.2.2 V2 sentences

The RTs of the different regions of the V2 sentences are illustrated in Figure 21 and Figure 22. Figure 21 shows the RTs in ms, while Figure 22 shows the residual reading times used for statistical analyses.

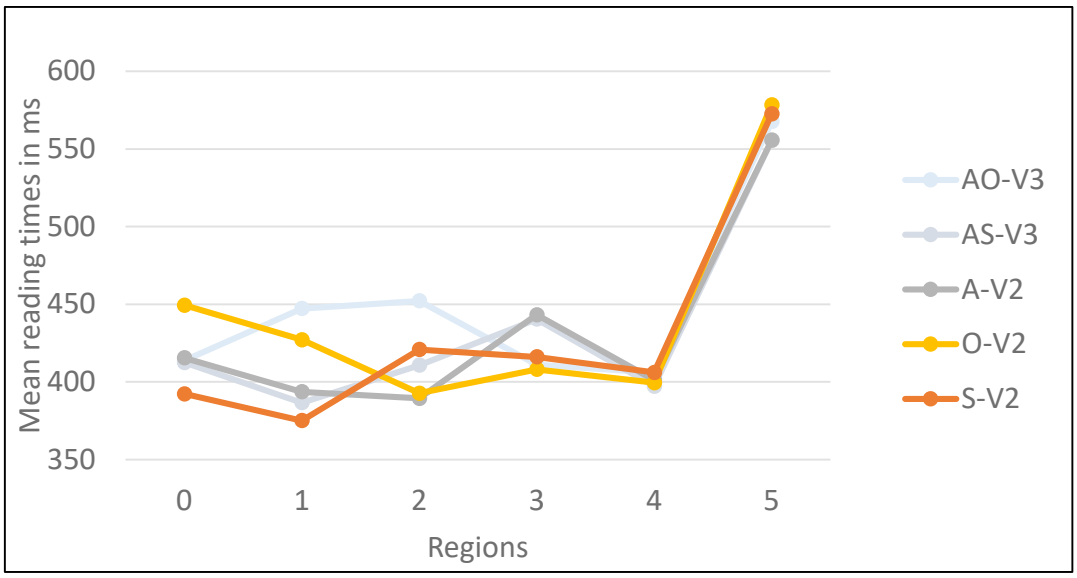


Figure 21: Mean reading times of all regions in the V2 conditions.

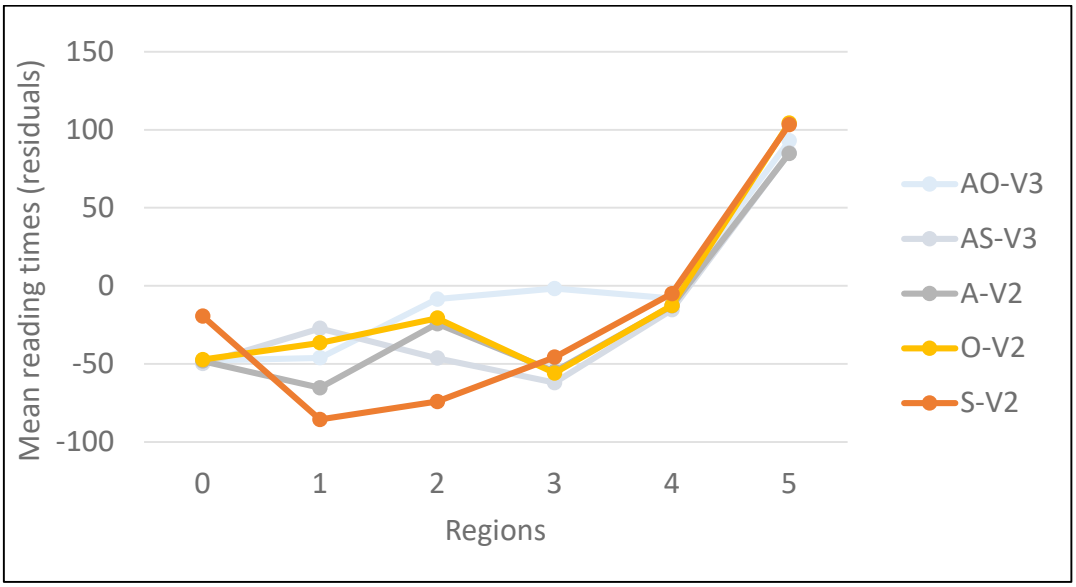


Figure 22: Mean residual reading times of all regions in the V2 conditions.

Region 0 – Preverbal position Semantic class had no effect on RTs ($\chi^2(2)$ = 0.0721, p > 0.9). A-V2 were read significantly slower than S-V2 (β=27.564, SE=7.179, t=3.839, p < 0.0002) but there was no difference between A-V2 and O-V2 (β=0.492, SE=6.972, t=0.071, p > 0.9). Pairwise comparisons revealed that the subject was read significantly slower than initial adverbials or objects. A summary is given in Table 19.

Multiple Comparisons of Means: Tukey Contrasts
Fit: lmer(formula = Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr))

	Estimate	Std. Error	z value	Pr(>|z|)
O-V2 - A-V2	0.492	6.972	0.071	0.94374
S-V2 - A-V2	27.564	7.179	3.839	0.00037 ***
S-V2 - O-V2	27.072	7.106	3.810	0.00037 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)

Table 19: Pairwise adjusted comparisons of the residual RTs of all conditions in region 0 of all V2 conditions.

Region 1 – Verb position Semantic class had no effect on RTs ($\chi^2(2)$ = 0.4043, p > 0.8). The verb in A-V2 was read significantly slower than that in S-V2 (β=-16.718, SE=7.322, t=-2.283, p < 0.03) but was read significantly faster than that in O-V2 (β=30.033, SE=7.039, t=4.267, p < 0.000). Pairwise comparisons revealed significant differences between the verbs in all conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr))				
	Estimate	Std. Error	z value	Pr(>|z|)
O-V2 - A-V2	30.033	7.039	4.267	3.97e-05 ***
S-V2 - A-V2	-16.718	7.322	-2.283	0.0224 *
S-V2 - O-V2	-46.751	7.260	-6.439	3.60e-10 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)				

Table 20: Pairwise adjusted comparisons of the residual RTs of all conditions in region 1 of all V2 conditions.

Region 2 – Postverbal position Semantic class had no effect on the RT ($\chi^2(2)$ = 1.0303, p > 0.5). The postverbal element in A-V2 was read significantly slower than the postverbal element in S-V2 (β=-50.522, SE=7.454, t=-6.778, p < 0.000). There was no difference between the postverbal element in A-V2 and O-V2 in O-V2 (β=4.769, SE=7.162, t=0.666, p > 0.5). Pairwise comparisons revealed significant differences between the residual RTs on the postverbal element between S-V2 and the other two conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr))				
	Estimate	Std. Error	z value	Pr(>|z|)
O-V2 - A-V2	4.797	7.162	0.670	0.503
S-V2 - A-V2	-50.507	7.456	-6.774	2.50e-11 ***
S-V2 - O-V2	-55.304	7.405	-7.469	2.43e-13 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)				

Table 21: Pairwise adjusted comparisons of the residual RTs of all conditions in region 2 of all V2 conditions.

Region 3 - last critical element Semantic class had no effect on RTs ($\chi^2(2)$ = 0.2769, p > 0.8). Table 22 and Table 23 illustrate that no significant effects were found.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals~Condition + (1|ItemNr) + (1|SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-55.1634	10.9897	82.4454	-5.020	2.94e-06 ***
O-V2	-0.1618	7.4473	664.6813	-0.022	0.983
S-V2	12.1224	7.7285	673.2990	1.569	0.117

Table 22: Output of the linear mixed model for region 3 of all V2 conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr))				
	Estimate	Std. Error	z value	Pr(>|z|)
O-V2 - A-V2	-0.1618	7.4473	-0.022	0.983
S-V2 - A-V2	12.1224	7.7285	1.569	0.329
S-V2 - O-V2	12.2842	7.6798	1.600	0.329
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)				

Table 23: Pairwise adjusted comparisons of the residual RTs of all conditions in region 3 of all V2 conditions.

4.3.3.2.3 Spill-over regions

No significant effect of Semantic Class was found in region 4 ($\chi^2(2) = 2.9851$, $p > 0.2$) and region 5 ($\chi^2(2) = 0.7712$, $p > 0.6$). There was no effect of condition. Table 24 and Table 25 illustrate this finding for region 4, while Table 26 and Table 27 illustrate this for region 5.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMod LmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-8.509	6.666	124.946	-1.276	0.204
AS-V3	-6.431	6.246	1171.214	-1.030	0.303
A-V2	-4.432	6.272	1172.670	-0.707	0.480
O-V2	-2.984	6.286	1171.871	-0.475	0.635
S-V2	4.710	6.480	1179.683	0.727	0.467

Table 24: Output of the linear mixed model for region 4 of all conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1|ItemNr) + (1| SubjectNr)					
		Estimate	Std. Error	z value	Pr(>|z|)
V3 comparisons	AS-V3 – AO-V3	-6.431	6.246	-1.030	1.000
V2 vs. AO-V3	A-V2 – AO-V3	-4.432	6.272	-0.707	1.000
	O-V2 – AO-V3	-2.984	6.286	-0.475	1.000
	S-V2 – AO-V3	4.710	6.480	0.727	1.000
V2 vs. AS-V3	A-V2 – AS-V3	2.000	6.273	0.319	1.000
	O-V2 - AS-V3	3.447	6.285	0.548	1.000
	S-V2 - AS-V3	11.141	6.484	1.718	0.857
V2 comparisons	O-V2 - A-V2	1.447	6.309	0.229	1.000
	S-V2 - A-V2	9.142	6.509	1.405	1.000
	S-V2 - O-V2	7.694	6.513	1.181	1.000
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 25: Pairwise adjusted comparisons of the residual RTs of all conditions in region 4.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMod LmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	95.543	22.505	95.235	4.246	5.07e-05 ***
AS-V3	-6.723	15.663	1145.224	-0.429	0.668
A-V2	-9.697	15.742	1145.812	-0.616	0.538
O-V2	12.506	15.717	1144.821	0.796	0.426
S-V2	13.560	16.151	1149.266	0.840	0.401

Table 26: Output of the linear mixed model for region 5 of all conditions.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1|ItemNr) + (1| SubjectNr)					
		Estimate	Std. Error	z value	Pr(>|z|)
V3 comparisons	AS-V3 – AO-V3	-6.723	15.663	-0.429	1
V2 vs. AO-V3	A-V2 – AO-V3	-9.697	15.742	-0.616	1
	O-V2 – AO-V3	12.506	15.717	0.796	1
	S-V2 – AO-V3	13.560	16.151	0.840	1
V2 vs. AS-V3	A-V2 – AS-V3	-2.974	15.770	-0.189	1
	O-V2 - AS-V3	19.229	15.752	1.221	1
	S-V2 - AS-V3	20.283	16.193	1.253	1
V2 comparisons	O-V2 - A-V2	22.203	15.846	1.401	1
	S-V2 - A-V2	23.257	16.266	1.430	1
	S-V2 - O-V2	1.054	16.225	0.065	1
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 27: Pairwise adjusted comparisons of the residual RTs of all conditions in region 5.

Table 28 and Table 29 show that there was no effect of PreverbalE and Verbpos.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-12.935	6.691	126.458	-1.933	0.0554
PreverbalE (Object)	4.905	5.913	1174.984	0.829	0.4071
PreverbalE (Subject)	5.240	6.016	1179.951	0.871	0.3839
Verbpos (third)	-3.861	4.518	1177.542	-0.855	0.3930

Table 28: Output for the factors PreverbalE and Verbpos (region 4).

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	85.85	22.58	96.50	3.802	0.000251 ***
PreverbalE (Object)	24.11	14.84	1147.92	1.624	0.104589
PreverbalE (Subject)	21.14	15.06	1149.82	1.404	0.160570
Verbpos (third)	-16.28	11.28	1148.49	-1.443	0.149199

Table 29: Output for the factors PreverbalE and Verbpos (region 5).

4.3.3.2.4 Verb position

The residual RTs on the verb positions were not affected by Semantic class ($\chi^2(2) = 1.0132$, $p > 0.6$). There were significant effects of Condition. The verb in AO-V3 was read significantly slower than in all the other conditions. The results are summarized in Table 30.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMod LmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-6.864	9.912	103.237	-0.692	0.490180
AS-V3	-38.477	7.743	1144.440	-4.969	7.76e-07 ***
A-V2	-59.188	7.759	1145.978	-7.628	4.98e-14 ***
O-V2	-29.455	7.740	1144.915	-3.806	0.000149 ***
S-V2	-74.745	7.976	1150.786	-9.372	< 2e-16 ***

Table 30: Output of the linear mixed model for the verb regions in all conditions.

Several effects were found in the multiple comparisons of the means. There were significant differences between all conditions except O-V2 and AS-V3 and S-V2 and A-V2.

Multiple Comparisons of Means: Tukey Contrasts Fit: lmer(formula = Residuals ~ Condition + (1|ItemNr) + (1| SubjectNr)					
		Estimate	Std. Error	z value	Pr(>|z|)
V3 comparisons	AS-V3 – AO-V3	-38.477	7.743	-4.969	4.71e-06 ***
V2 vs. AO-V3	A-V2 – AO-V3	-59.188	7.759	-7.628	2.14e-13 ***
	O-V2 – AO-V3	-29.455	7.740	-3.806	0.000577 ***
	S-V2 – AO-V3	-74.745	7.976	-9.372	< 2e-16 ***
V2 vs. AS-V3	A-V2 – AS-V3	-20.712	7.724	-2.682	0.021979 *
	O-V2 - AS-V3	9.022	7.705	1.171	0.241626
	S-V2 - AS-V3	-36.269	7.940	-4.568	2.96e-05 ***
V2 comparisons	O-V2 - A-V2	29.733	7.711	3.856	0.000577 ***
	S-V2 - A-V2	-15.557	7.963	-1.954	0.101480
	S-V2 - O-V2	-45.290	7.923	-5.716	8.72e-08 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 (Adjusted p values reported -- Holm method)					

Table 31: Pairwise adjusted comparisons of the residual RTs of the verb in all conditions.

4.3.4 Discussion

Examining the overall RTs in all regions, the data reveal that both V3 structures differ from each other significantly. AS-V3 is read faster than AO-V3 and AS-V3 is read similarly fast as the non-object-initial V2 sentences. In the analysis without the spill-over area, this effect was even stronger. AO-V3 was read significantly slower than all the other conditions and there was no difference between AS-V3 and V2. These are important findings because they cast a new light on the question of which role verb placement plays in sentence processing. It seems that the preverbal constituent has a much more substantial impact than the position of the verb itself. The conclusion that verb placement is not a crucial factor in the overall RT is supported by the linear mixed model, which revealed that the verb position did not affect the RTs but the type of the preverbal elements did. Sentences with initial objects were read slower than sentences with

initial non-objects. This, one could argue, might indicate that the experiment failed in allowing O-V2 sentences. However, in the analysis excluding the spill-over area, the difference between the V2 structures was not significant, and the difference between AO-V3 and the other structures was even greater with highly significant results. This could indicate that effects in O-V2 appear in the spill-over area, where the sentence wrap-up occurs. The effect does not seem as strong for AO-V3, though. There was no significant difference between the V2 structures and AS-V3, suggesting that AO-V3 is unique because it evokes higher overall RTs than other structures. AS-V3 is unique because, even though it is not V2, it does not differ in RTs from V2 declaratives. However, the study did not show an effect of the semantic class of the adverbial. The similarity between AS-V3 and V2 is remarkable; but still, from the overall RTs, it is impossible to infer in which regions V3 sentences differ from each other as well as from V2. Below, we shift the focus away from the global perspective to take a closer look at differences within the regions.

Concerning the previous predictions and to summarize the findings of the overall RTs, two predictions could be confirmed, one prediction could partly be confirmed, and one prediction was not confirmed:

✓ (P1a) Overall, Adv-S-V_{fin} is read faster than Adv-Obj-V_{fin}.
(Adv-S-V_{fin} < Adv-Obj-V_{fin})

✓ (P1b) Overall, V2 is read faster than V3.
(V2 < V3)

× (P1c) Overall, temporal and local adverbials lead to faster RT in Adv-S-V_{fin}.
($Adv_{temp/loc}$-S-V_{fin} < Adv_{mod}-S-V_{fin})

(✓) (P1d) Overall, there are no differences between the RTs of the V2 sentences.
(S-V2 = A-V2 = O-V2)

In the preverbal area of the V2 sentences, the subjects received higher reading times than adverbials or objects. This is somewhat surprising since the experimental setup should have prevented different RTs on the initial constituent. If any effect were expected to occur at all, then it would be subjects exhibiting faster RTs due to the subject-first preference. One could argue that the reason for this finding might be the experimental items: According to the literature, AS-V3 prefer subject topics in the form of anaphorical pronouns. Therefore, anaphorical elements (i.e., pronouns) were used in the experiment. Higher RTs on the subject could emerge because the pronouns need to be related to their preceding antecedents mentioned in the context sentence. This was not only the case for V2 but also for the V3 sentences; though in V3, the differences between object and subject were not as large as in V2. However, upon closer inspection, this explanation can be put into question. The subject in Adv-O-V_{fin} is read

significantly slower compared to all other conditions, while no such difference occurred in the subjects of the other conditions.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals~Condition + (1|ItemNr) + (1|SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-1.801	7.724	108.247	-0.233	0.816053
AS-V3	-24.135	6.660	1179.147	-3.624	0.000303 ***
A-V2	-22.425	6.659	1179.702	-3.368	0.000782 ***
O-V2	-17.524	6.640	1178.817	-2.639	0.008418 **
S-V2	-16.285	6.815	1184.633	-2.389	0.017032 *
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 32: Output of the linear mixed model for the comparison of all subject positions.

Remarkably, there were no differences between adverbials and only minor significant differences between objects, with objects in S-V2-(O) being read significantly faster than in the other constructions.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-45.086	11.888	107.398	-3.793	0.000247 ***
AS-V3	-17.588	9.310	1165.349	-1.889	0.059127 .
A-V2	-9.278	9.357	1166.345	-0.992	0.321606
O-V2	-1.618	9.314	1165.808	-0.174	0.862096
S-V2	-29.287	9.605	1170.385	-3.049	0.002347 **
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 33: Output of the linear mixed model for the comparison of all object positions.

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest'], Formula: Residuals ~ Condition + (1 | ItemNr) + (1 | SubjectNr)					
	Estimate	Std. Error	df	t value	Pr(>|t|)
Intercept	-47.7857	9.1011	106.9050	-5.251	7.77e-07 ***
AS-V3	-2.0523	7.1970	1175.5987	-0.285	0.776
A-V2	0.6004	7.2749	1177.3408	0.083	0.934
O-V2	-8.0674	7.2363	1176.1102	-1.115	0.265
S-V2	3.0930	7.4592	1181.9450	0.415	0.678
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 34: Output of the linear mixed model for the comparison of all adverbial positions.

I interpret this as even stronger evidence that Adv-O-V_{fin} evokes processing difficulties in the postverbal area. Nonetheless, testing full DPs in AS-V3 sentences would be highly fruitful to eliminate the internal syntax of the subject-DP as a confounding factor. It is worth noting that this might be at the expense of the authentic quality of the test items, at least to a certain degree.

While the initial constituent exhibited no differences in V3, the fact that both V3 structures differed in the preverbal region strongly suggests that the parser applies different parsing strategies. However, the data display the exact opposite of what has been predicted: Preverbal subjects were read slower than preverbal objects. If the parser expects a subject after the initial adverbial more than it expects an object, then RTs on the subject should be lower. There is, however, a possible explanation for this effect: High RTs on the subject could reflect the re-ranking of predicted candidates or the re-analysis of the predicted structure. After the initial adverbial, the parser expects the verb, but instead, a subject occurs. The parser realizes that the structure is not a V2 declarative, but a V3 declarative in the form of AS-V3. Hence, on the subject, the initial adverbial is re-analyzed as a possible frame-setter or discourse linker, and the structure AS-V3 is being predicted. This does not occur in AO-V3, where the parser is not able to predict the following constituents or the overall structure of the following syntagma. This is supported by the fact that the verb in AS-V3 is read faster than the verb in AO-V3. In the former structure, the verb is expected to occur while this is not the case in the latter. In sum, predictions (P2a) and (P2c) were confirmed, but (P2b) was not:

✓ (P2a) In the initial position, Adv-S-V_{fin} does not differ from Adv-O-V_{fin}.
(Initial $pos_{Adv\text{-}S\text{-}Vfin}$ = Initial $pos_{Adv\text{-}O\text{-}Vfin}$)

× (P2b) In the preverbal position, Adv-S-V_{fin} is processed faster than Adv-O-V_{fin}
(Second $pos_{Adv\text{-}S\text{-}Vfin}$ < Second $pos_{Adv\text{-}O\text{-}Vfin}$)

✓ (P2c) In the verb position, Adv-S-V_{fin} is processed faster than Adv-O-V_{fin}
(verb $pos_{Adv\text{-}S\text{-}Vfin}$ < verb $pos_{Adv\text{-}O\text{-}Vfin}$)

Regarding the processing of the verb, the data indicate that processing the verb in the second position is generally easier than processing the verb in the third position. However, there were differences between AS-V3 and AO-V3 with respect to the RTs at the verbs in V2. While there were highly significant differences between AO-V3 and all the other conditions, the difference between AS-V3 and V2 was more complex. Verbs in S-V2 sentences were read significantly faster than verbs in AS-V3. This might be an effect of the expectations of the parser: The parser expects a verb after the subject as the second element, since having the verb in the second position is the prototypical declarative word order. However, it was not always the case that V2 outperformed V3 in RT at the verb. There was no significant difference between the RTs of the verb in O-V2 sentences and the verb AS-V3 sentences.

It is worth noting that this observation indicates that the parser does not apply V2 processing mechanisms on V3 sentences, which indicates different mental or grammatical representations. If one takes into consideration the different RT at the verb in both V3 structures, preverbal

objects slow down RTs at the following verb. One would not expect a difference of the RTs at the verb between AO-V3 and O-V2 if the parser applies similar processing mechanisms to V3 sentences. If this were the case, the parser would treat V3 as V2 with a sentence-initial adverbial. Between AO-V3 and O-V2, the RT at the verb also differed significantly, but between AS-V3 and O-V2, no such difference was observed at all. One way to explain these findings is that the parser tries to integrate the initial adverbial in V3 sentences, storing the information in short-term memory just as it stores information about topicalized objects. Both strategies might increase RTs on the verb if the reorganization of possible candidates spills over to the verb in Adv-S-V_{fin}. This would then even out possible RT differences on the verb in AS-V2 and O-V2 due to different reasons. In AO-V3, no information about the adverbial is being stored, and the preverbal object does not allow for any predictions. This could explain why AO-V3 and O-V3 differ. More evidence comes from the comparisons of A-V2 and V3. If the parser had difficulties with both V3 structures but not with V2, then we would expect both V3 to differ from all the V2 structures to the same extent. However, in AO-V3, the difference in RTs at the verb compared to the verb in A-V2 is highly significant, whereas the difference between A-V2 and AS-V3 is significant. This implies that the results are much more robust between AO-V3 and A-V2 than between AS-V3 and A-V2.

Let us examine the reason for this finding. A possible explanation could be that the adverbial in both AS-V3 and A-V2 is interpreted as a discourse linker or a frame-setter, whereas in AO-V3, this option does not exist. This information is carried over to the verb in both structures, but not in AO-V3. As indicated above, the preference for initial frame-setters is already reported in the corpus study by Speyer (2010). Evidence that the adverbial is interpreted as a frame-setter or discourse linker comes from the effect of the semantic class of the adverbial in processing the preverbal element. The only significant effect of the semantic class of the initial adverbial occurred on the preverbal element of V3 sentences. The data strongly suggest that the preverbal constituent is read faster with temporal adverbials. This points to a preference in V3 for the sequence TEMPORAL ADVERBIAL >> X. Note that no interaction of the condition and semantic class was found. Thus, (P3a) was confirmed and (P3b) was not confirmed:

✓ (P3a) Temporal and local adverbials lead to faster reading of the subject in Adv-S-V_{fin}, but modal adverbials do not.
($Adv_{temp/loc}$-S-V_{fin} < Adv_{mod}-S-V_{fin})

× (P3b) The semantic class of the adverbial does not affect the RTs on the object in Adv-O-V_{fin} sentences.

The expectations of the parser described above can be furthermore interpreted against the background of probabilistic parsing and the fine-grained frequency of the V2 and V3 structures. Overall, as indicated above, S-V2 is the most frequent form, followed by A-V2 and O-V2. Among V3, AS-V3 is more frequent than AO-V3, and thus we end up with the following hierarchy in terms of frequency of V3 and V2 sentences:

(65) S-V2 > A-V2 > O-V2 > AS-V3 > AO-V3

Due to frequency, the parser expects a verb after the first position; but if another element occurs, it is more likely that the second element is a subject rather than an object.

What do these results mean for the questions asked at the beginning of the chapter? The questions are repeated below.

1. Does Adv-S-V_{fin} differ from Adv-O-V_{fin} in processing?
2. Which role does verb placement play in sentence processing?
3. Which role does the preverbal constituent play in sentence processing?

AS-V3 differs from AO-V3 in many respects, most importantly, in the immediate preverbal region and the verb region. The data indicate an influence of the preverbal element on sentence processing and less for the influence of verb placement. AO-V3 sentences seem especially challenging for the parser. Preverbal objects evoke higher reading times of the verb because the parser does not predict a verb to follow an AO sequence. Subjects in AS-V3 are read slower because the parser re-analyzes or re-ranks structures and assigns a structure for AS-V3. These data strongly suggest that there are different mental representations for AS-V3 and AO-V3. While the former exhibits similarities with V2 processing, there is no indication that the parser is able to assign a structure or representation to AO-V3. At the same time, AS-V3 does not seem to be processed like V2 with an initial adverbial but instead has a unique status as a V3 declarative. The data strongly support what the previous chapters have shown: AS-V3 makes use of properties provided by German grammar and the parsing system. This is not the case for AO-V3.

In empirical studies, there might be certain factors that could impact the data in an unforeseen way. A reasonable objection against applying a self-paced reading paradigm is that AS-V3 is a phenomenon of spoken language. Hence, encountering AS-V3 in a self-paced listening study might have felt more authentic to the participants and could have led to different results. However, in a self-paced listening study, prosody is predetermined by the experimental setup. AS-V3 occurs with and without pauses between the adverbial and the subject and no main accent on pronominal subjects. In a self-paced reading paradigm, participants can still make use

of subvocalization ("silent speech"), activating phonological information in reading (cf. Abramson & Goldinger 1997, Eiter & Inhoff 2008), while in self-paced listening, this option does not exist. Hence, it is questionable if self-paced listening would be a more authentic choice. The second possible problem lies in the choice of the stimuli. The data concerning the subject could be influenced by the fact that the subject is an anaphorical pronoun. However, the stimuli were developed in order to meet the conditions of corpus studies and here, the subject is, in most cases, a pronoun. This naturally occurring configuration cannot be ignored when determining the status of V3 in German because it constitutes the most frequent case of AS-V3. However, an additional study with topic subject DPs could further strengthen the analysis presented above. Nevertheless, the data suggest that postverbal anaphorical subjects are more problematic for AO-V3 than for the other structures.

4.4 Chapter summary

This chapter dealt with the status of V3 from the perspective of sentence processing. I provided an overview of key concepts concerning the architecture of the parser and factors that influence sentence processing, i.e., the architecture of the human parser, expectation and surprisal, context, and frequency. Drawing from the literature, I showed that all of these factors greatly influence the processing of preverbal elements in V2 and V3 sentences. I discussed previous findings on V2 processing that showed that there is a robust subject-first preference and that sentence-initial objects in V2 sentences are read faster than initial subjects only under specific contextual conditions. These conditions trigger object topicalization, in which case the object needs to be explicitly mentioned in the context. These findings were greatly relevant for testing V2 and V3 clauses in the self-paced reading experiment.

The data from the self-paced reading experiment revealed that overall, Adv-S-V_{fin} sentences differ from Adv-O-V_{fin} sentences in processing, with the former being read faster than the latter. In addition, Adv-S-V_{fin} did not differ from S-V2 and A-V2 sentences in the overall reading times. These findings are relevant since they show that the parser does not have difficulties in processing V3 as such. In contrast, the whole structure is pertinent in terms of sentence processing. In particular, the preverbal area and the verb show major differences between both V3 structures. This has severe consequences for the status of V3 because it implies that the verb-second constraint, even though it appears to be very robust in German, is not a rigid constraint but allows for deviations within specific systematic limitations.

The study also gives interesting results for the individual regions, which, again, has direct implications for the status of V3. While both V3 structures did not differ in the initial position,

subjects were read slower than objects in Adv-S-V_{fin} and Adv-O-$V_{fin,}$ respectively. I interpreted this as reflecting the possible re-ranking or re-analysis of the predicted structure in Adv-S-V_{fin} because the parser detects non-V2 and tries to provide alternative predictions. In Adv-O-V_{fin}, this is not the case since no alternative is possible. This was supported by the fact that in Adv-S-$V_{fin,}$ verbs were read faster than in Adv-O-V_{fin}. In addition, there are more robust differences in the reading times of the verb in Adv-O-$V_{fin,}$ and all other structures compare to Adv-S-V_{fin} and all other structures. The difference between Adv-O-V_{fin} and V2 was statistically much more robust than the difference between Adv-S-V_{fin} and V2. This indicates that in Adv-O-$V_{fin,}$ the parser has difficulties processing the verb compared to the other structures. While verbs following subjects were generally read with the highest speed, verbs after adverbials did not differ in reading time from verbs in Adv-S-V_{fin}. Still, the verbs in Adv-S-V_{fin} were read slower than verbs in S-V2, indicating that the parser does not analyze Adv-S-V_{fin} as S-V2 with a preposed adverbial but applies other parsing strategies. The data also show that temporal adverbials facilitate the reading of the preverbal element in V3, a finding that is in line with corpus studies that show that the adverbial in Adv-S-V_{fin} is predominantly temporal.

Overall, the study shows that the type of the preverbal element has a stronger impact on processing sentence structures than verb placement in declaratives. The findings suggest that Adv-S-V_{fin} has a mental representation in German, while Adv-O-V_{fin} does not, indicating a legitimate place of V3 in the grammar of German. In the next chapter, I discuss how the grammatical representation of V3 can be modeled against the background of the results presented in the previous chapters. I address this question by taking our findings on the use and processing of V3 as a testing ground for syntactic theories.

Chapter 5: Syntactic representation of V3

In this chapter, I turn to the fourth main research question of my investigation into the status of V3 in German: How can the grammar of V3 be modeled? In the analysis, I take into account the results from the three different perspectives on V3 in German presented in the previous chapters: language use, acceptability, and processing. I apply empirical findings concerning the status of V3 to grammatical theory building.

Modeling grammatical variation has been a main research focus for decades but recently received further attention with findings from the domain of multilingualism (Amaral & Roeper 2014, Goldrick et al. 2016). In the context of language acquisition, Tracy (2002: 678) states:

> For any kind of linguistic theory, variation is a problem. At the same time, it is also a great asset and may hold the essential key to understanding developmental dynamics: variation in the input and differences between current hypotheses and the input challenge the learner's problem-solving capacity.

As variation can reveal language-related developments in the mind of learners, it can also be of great value in challenging existing linguistic theories that often are built on standard language data. V3 sentences most certainly, do not belong to phenomena of the standard language and hence is an excellent test case that can provide highly important insights into the grammatical system.

The grammar of V3 has been a major research topic in syntax theory for a relatively short period of time compared to other linguistic phenomena. V3 has been investigated in the majority languages in multilingual urban areas in Europe, and research in the generative framework has provided several promising suggestions for the structure of V3 since the early 2010s. Crucially, these analyses do not dismiss V3 as an instance of language performance that does not reflect the actual mental grammar of speakers, and these generative approaches are, to my knowledge, the only existing grammatical approaches to the syntax of V3 to date. This is particularly interesting since alternative theories, such as Cognitive Construction Grammar, explicitly investigate the periphery of grammar and acknowledges phenomena in this domain as integral and extremely informative for grammatical theory. In addition, Cognitive Construction Grammar is explicitly interested in considering psycholinguistic data when modeling the grammar of constructions. However, to the best of my knowledge, there is not yet any analysis of V3 within the framework of Construction Grammar. This is possibly because word order is generally not a major focus of research in that framework, in contrast to specific constructions (see, among many others, the *gehören*-construction in Lasch 2018 or *sound-verb*-constructions in Goschler 2011). However, as I will illustrate below in detail, some relevant

construction-based work has been conducted in the fields of sentence types, V2, and apparent multiple prefields (see Wetta 2011, Panther & Köpcke 2008, Jacobs 2016). This research constitutes a valuable starting point for modeling V3. In taking both perspectives into account, the generative and the construction-based perspective, this chapter treats V3 as a test case of how syntactic variation can be modeled in both frameworks based on empirical evidence.

The chapter is structured as follows. First, I present the generative approach to V3. To start with, I summarize general assumptions of Generative Grammar, including the linguistic architecture, the derivation of sentences, and sentence cartography. I then discuss generative analyses of V3 from the literature and analyze them against the background of the empirical findings from the previous chapters and from previous research on V3. I then proceed with a construction-based analysis of V3. I first present the general assumptions of Cognitive Construction Grammar, including the Tripartite Parallel Architecture model (Jackendoff 1997, 2002). Against this background, I propose a construction-based analysis of V3, which is in accordance with the fundamental principles of Cognitive Construction Grammar. Finally, I discuss an account on construction parsing applying the model developed in Jurafsky (1992, 1996) and taking into consideration the empirical findings from the previous chapters.

5.1 The generative approach

In this section, I discuss fundamental assumptions concerning Generative Grammar that are crucial for modeling V3. In Generative Grammar, the V2 phenomenon is very well researched and it has recently received attention within the discussion concerning V3. Some of the most discussed topics in V2 syntax concern the preverbal area and two questions are particularly prevalent: 1. How do elements get into the first position of a clause? 2. Do all V2 sentences have the same structure? These questions are also of great significance for V3. Therefore, in order to model V3 in a generative framework, the questions can be further specified in the following way:

1) What is the status of the preverbal constituents? How do they get into their positions?
2) Is there empirical evidence for movement or base-generation of the initial adverbial?
3) Why are objects in the second position prohibited?
4) What is the syntactic structure of V3?

In order to answer these questions, I first provide some necessary background information on Generative Grammar. I focus on four areas that are most important for modeling V3: Sections 5.1.1.1 and 5.1.1.2 deal with the assumptions concerning the architecture of grammar and structural derivation. These topics are essential because they make statements about the mental representation of language, which is immediately relevant to the mental representation

of V3. The section includes the concepts *merge*, *move*, and *adjoin*. Section 5.1.1.3 focuses on the cartographic approach because it explicitly states that information structure is encoded in syntax. As we have seen before, information-structure is crucial for V3 sentences, and thus discussing its representation in generative theory is especially fruitful. Drawing from these aspects, I turn to the empirically motivated analysis of V3 within the generative framework in section 5.1.2. I discuss the status of the preverbal elements with respect to movement, adjunction, and their positions in the syntactic structure. Lastly, I test whether V3 can be modeled in Optimality Theory, the most widespread generative account on word order variability.

5.1.1 General assumptions

5.1.1.1 The architecture of grammar

Generative grammar (GG) assumes that the human language faculty is genetically determined and located in a specific area in the brain. Chomsky (1995: 167) states:

> The human brain provides an array of capacities that enter into the use and understanding of language (the *language faculty*); these seem to be in good part specialized of that function and a common human endowment over a very wide range of circumstances and conditions.

One of the functions of the language faculty is the generation of sentence structures. GG distinguishes between lexical items and rules that generate structures, which allows the generation of an indefinite number of structures with a finite number of elements and rules. Hence, it distinguishes between lexicon and grammar. The language faculty is embedded in the cognitive system and has a modular structure. The most fundamental module is the syntactic module that provides rules to generate structures. These structures are then interpreted at interfaces. Figure 23 illustrates the architecture of language in GG.

The computational system, consisting of the lexicon and the inventory of grammatical rules, interacts with two external components, the articulatory-perceptual system (A-P) and the conceptual-intentional system (C-I), through the interfaces Phonetic Form (PF) and Logical Form (LF), respectively. A-P is responsible for the articulation of a string that the computational system generates. C-I allows for the semantic and logical interpretation of the structure. Therefore, the computational system is the fundamental linguistic machinery.

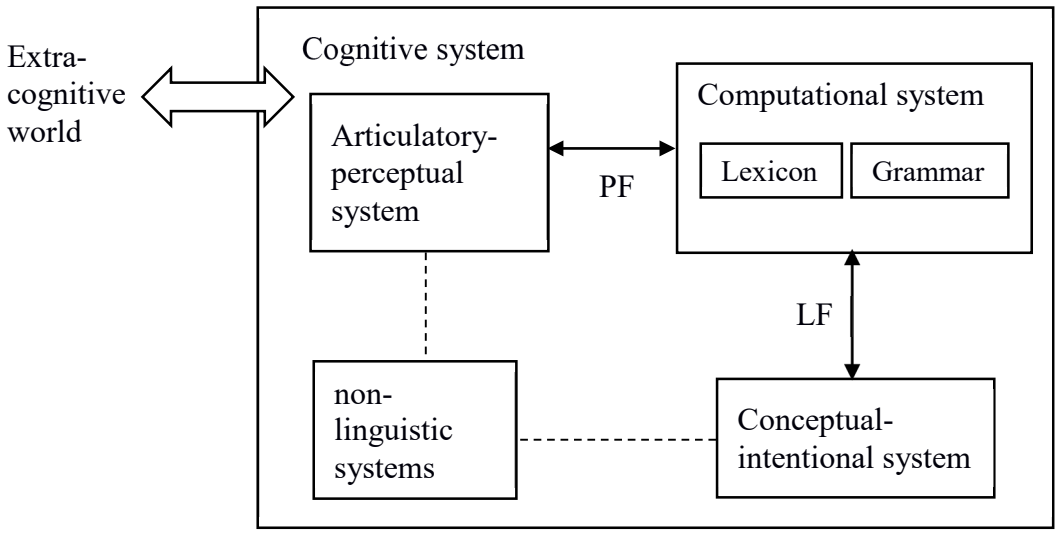


Figure 23: The cognitive system in Generative Grammar (Mensching 2008:4).

GG assumes that certain syntactic principles are inherent to humans, biologically determined, and thus universal. In addition to principles, languages have parameters that explain syntactic variability among languages. One of the crucial tasks of language acquisition is setting these parameters according to the linguistic input.

GG distinguishes between 'competence' and 'performance' in language. Competence is the underlying linguistic knowledge that is the basis for structures, while performance is the actual output. Performance is influenced by several factors, such as memory, focusing, and the articulatory system. These factors lead to errors in language production so that linguistic knowledge is covered by noise. In an early version of GG, Chomsky (1965: 3) states that linguistic theory should focus on an ideal "speaker-listener" who lives in a "completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance". GG is thus interested in the underlying principles of language, while phenomena at the edge of core-grammar, for example, Adv-S-V_{fin} structures, are traditionally only of secondary interest. However, some researchers explicitly state that variation might be of great interest and highly revealing for the generative approach. Schulz & Tracy (2018: 143) state that universal grammar "certainly does not prevent us, as adults, from conjuring up non-canonical structures". In the context of language acquisition, this is especially interesting because some structures might be "particularly revealing with respect to the puzzles learners struggle with during specific developmental phases." (Schulz & Tracy 2018: 143). Grammatical variation should thus be perceived as a source for uncovering processes that

concern language acquisition. In turn, if we aim to understand how language is acquired, we need to understand the status of specific structures, such as V3, in the grammatical system, and how these patterns emerge in speakers who produce these patterns as input for learners. Crucially, this is independent of the underlying grammatical framework.

5.1.1.2 The derivational system

In GG, derivation means the computation of sentence structures based on specific grammatical principles. In Minimalism (Chomsky 1995, Adger 2003), the elements needed for an utterance are chosen from the lexicon and then listed in an enumeration string. These elements are then taken via SELECT, combined via the operation MERGE, and moved to other positions in the structure via MOVE. The outcome of the derivation is a syntactic tree with binary branching that is interpreted at the two interfaces LF and PF. These interfaces forward the information to the C-I system and the A-P system, respectively. Figure 24 illustrates this mechanism.

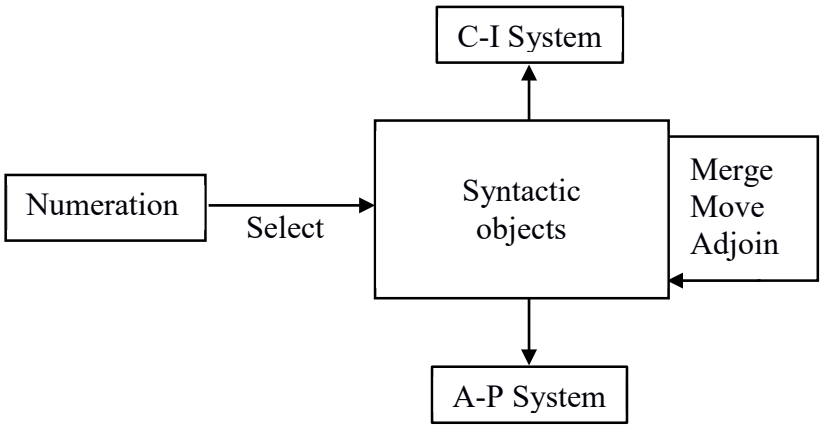
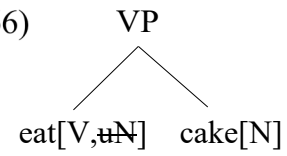


Figure 24: Derivation processing in minimalist syntax, computational system and interfaces (Adger 2003: 146).

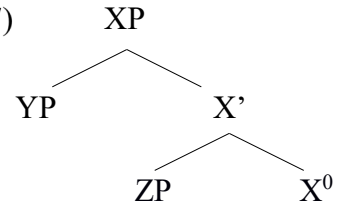
Adger (2003) includes ADJOIN as an operation that allows for integrating adjuncts into the tree. ADJOIN differs from MERGE in that 'feature checking' is not necessary. Features are properties that elements are equipped with, enabling them to establish a relationship with other elements. There are two types of features, interpretable features (e.g., phi-features of nouns) and uninterpretable features (phi-features of function heads). In order for LF to interpret the tree structure, uninterpretable features have to be eliminated via feature checking. Feature checking takes place if an element has an uninterpretable feature and a second element has the matching counterpart to this feature, as in (66):

(66)



The verb *eat* has an uninterpretable N feature, i.e., it requires a noun. The noun has a [N]-feature. Both elements establish a sisterhood relation, and thus [uN] can be checked and thus be deleted. The remaining feature [V] is percolated and determines the phrase type VP. LF can now interpret the string since the u-feature is deleted. MOVE takes place in order to check other features in the syntactic tree. However, it only takes place under specific conditions. Constituents move in a step-by-step manner and usually do not travel long distances. Due to perlocation and projections, a syntactic tree consists of specific positions with distinct functions that have been established in x-bar theory (Chomsky 1970):

(67)



YP is referred to as 'specifier', and ZP is referred to as 'complement'. In addition, there are 'adjuncts'. Specifiers further qualify the head, while complements are elements that the head requires, e.g., objects of verbs. In most cases, adjuncts are optional elements that do not rely on other elements. X' is an intermediate projection of features that are necessary for the derivation. XP is the maximal projection. Taking into consideration these fundamental principles, a prototypical V2 sentence in German would have the structure, as illustrated in Figure 25.

CP is the maximal projection of a phrase with SpecCP as the position of the initial constituent, while IP is reserved for verbal inflection. Arguments are generated in a specific configuration to the verb to allow for the assignment of case and theta roles, agreement, and matching of features. In a nutshell, a traditional approach on V2 assumes that the verb is base-generated in the final position of the clause in v^0, and then moves to I^0 in order to enable subject-verb-agreement to take place. The subject is usually considered to be base-generated in SpecIP, even though some accounts argue for a VP-internal analysis, assuming the subject to be base-generated in SpecVP. The subject then moves to SpecCP due to an EPP feature, a feature that attracts the subject. The verb then moves to C^0. Adjuncts, such as subordinate clauses, can right-adjoin to IP.

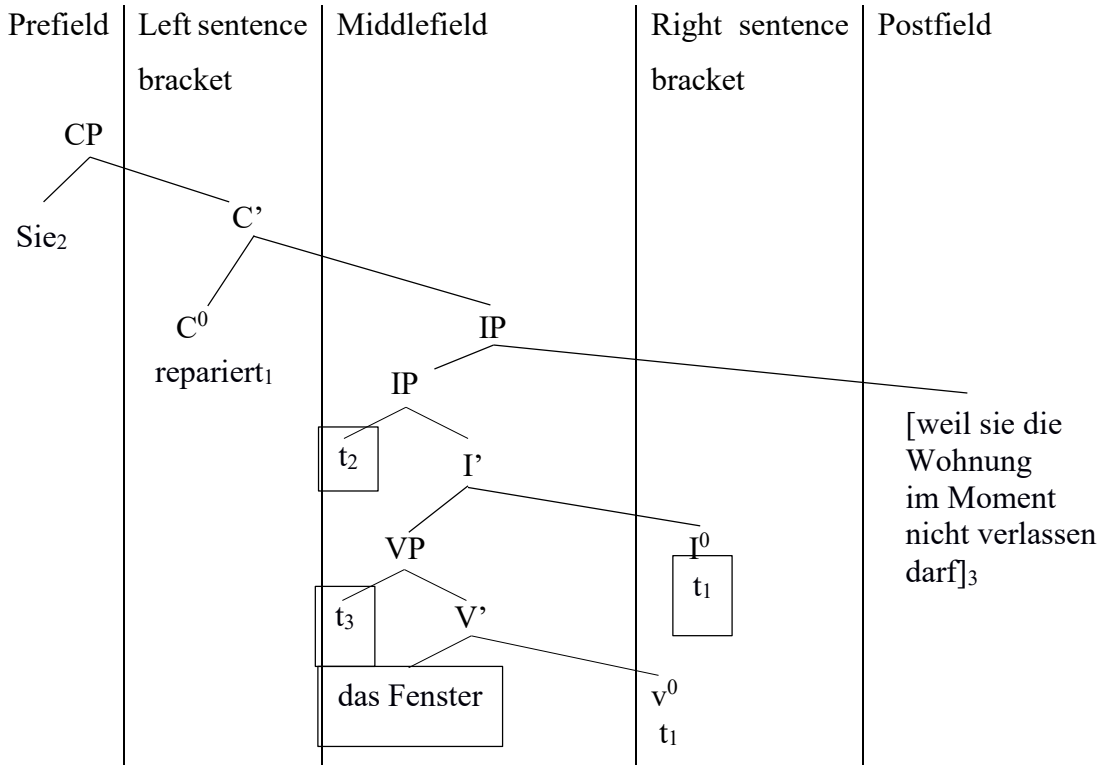


Figure 25: Representation of a V2 clause in generative syntax.

Even though minimalist syntax does not require x-bar because the operations SELECT, MOVE, MERGE, and ADJOIN are responsible for the syntactic structure (cf. Grewendorf 2002: 126), x-bar is still used as a visual means to illustrate syntactic derivation. Besides, the figure above illustrates that x-bar theory can be mapped onto the topological model of German[21]. Each field corresponds to a specific domain in the syntactic tree. Consequently, what is important for modeling the preverbal area is the CP because it is the landing position for preverbal constituents. For V3, the question is how the model can account for two preverbal constituents that occur, as the structure presented above only has one landing position for one constituent, namely SpecCP. One possibility is making use of the cartographic approach.

5.1.1.3 The cartographic approach

In the cartographic approach on sentence structure, Rizzi (1997) argues for multiple functional projections within the CP layer ("split-CP"). These projections encode information structure and mediate between syntax and pragmatics. According to Rizzi (1997), CP is different from IP in that the former is not an extension of the V-system, but it touches areas outside the actual clause, e.g., discourse. An argument for this distinction can be found in the

[21] For a detailed comparison of x-bar and the topological field model see Olsen (1982).

functions of IP and CP and the processes taking place here. While in IP morphological processes take place, e.g., assigning tense or realizing subject-verb agreement, CP hosts functional elements, such as functional morphemes. Rizzi (1997) argues for two functional layers that constitute the CP: force and fin(iteness). Force expresses clausal type and illocutionary force, while fin(iteness) determines whether a clause is finite or nonfinite. Furthermore, Rizzi (1997) argues for two separate projections Top(ic) and Foc(us), which are the positions for the topic and focus, respectively. These projections are only generated when needed; hence, they are not empty but absent if there is no constituent filling these projections. With the introduction of Top and Foc, the account explicitly states that information structure is coded in syntax. Some languages, such as English or German, mark topics with word order or intonation, as illustrated in (68). In these languages, the heads in both functional projections are empty. However, other languages have overt TopP and/or FocP heads, e.g., Japanese or Gungbe. Therefore, Topics appear in SpecTopP, while particles marking topics occur in $TopP^0$:

(68) a. Your book, you should give t to Paul (not to Bill)
b. YOUR BOOK you should give t to Paul (not mine) (Rizzi 1997: 285)

(69) John wa gakusei desu.
John TOP student is
'John is a Student.' (Japanese, Kuno 1973: 38)

(70) dàn lɔ́ yà Kòfí hù -i
snake the TOP Kofi kill -3sg
'This Snake, Kofi has killed it.' (Gungbe, Aboh 2004: 291)

(71) bléún wɛ̀ Sɛ́ná gbá xwé étɔ̀n
quickly FOC Sena build-Perf house his
'I think that this is the book that Sena has read.' (Gungbe, Aboh 2004: 240)

Rizzi (1997) argues that TopP can be recursive, in contrast to FocP. While a comment to a topic can function as a new topic, presupposition cannot be a newly focused element at the same time. In addition, Rizzi (1997) observes that multiple topics are possible, but there can only be one focused element in a clause. Besides, the order of topics and focus is not restricted, i.e., TopP can precede or follow FocP. In sum, Rizzi suggests the following sentence structure in split-CP analysis[22]:

[22] Over the last two decades, Rizzi's (1997) analysis has undergone several adjustments. For example, based on Italian, Rizzi & Bocci (2017) argue for three additional functional projections: *Int*, *Mod*, and *Qemb*. *Int* hosts interrogative complementizers, *Mod* preposed, clause-initial adverbials that are neither topics nor focus but highlighted (Rizzi & Bocci 2017), and *Qemb* hosts wh-elements in embedded contexts. Rizzi & Bocci (2017: 9) tentatively suggest the following structure:

(72) [Force [Top* [Foc [Top*[Fin [IP...]]]]]]

The structure has been adjusted frequently and more functional projections have been suggested subsequently. Frascarelli & Hinterhölzl (2007), for example, argue for different topic projections that encode specific types of topics. These projections are orders, leading to the following sentence structure:

(73) ForceP > ShiftP > ContrP > FocP > FamP > FinP

The cartographic approach with designated topic positions has severe consequences for V2 and V3 declarative clauses because one needs to identify the positions to which subjects and verbs move, given the fact that several projections can potentially host those elements. Several studies state that the verb appears in different positions, depending on the type of V2 language. Wolfe (2015) argues for two classes of languages: high V2 languages, in which the verb appears in Force^0, and low V2, in which the verb appears in Fin^0. In order for the derivation to succeed, Wolfe (2015) makes the following assumptions: First, each structure is equipped with an Edge Feature (EF) and an uPhi feature that both need to be checked in the derivation process. EF is responsible for attracting a constituent to the edge of a structure (cf. Wolfe 2015). Second, FinP serves as a 'bottleneck' (cf. Haegeman 1996, 2012, Roberts 2004): In low V2 languages, the finite verb moves to Fin^0, while the preverbal constituent moves to SpecFin. From there, it can move further to higher functional projections, and at the same time, it blocks any movement of other constituents into the CP domain. In high V2 languages, the verb moves through Fin^0 and eventually to Force^0. The preverbal element then appears in SpecForceP (c.f. Poletto 2002). Wolfe (2015) proposes that languages can vary with respect to the position of the bottleneck. In some languages, ForceP is the bottleneck, while in others, it is FinP. The bottleneck in FinP accounts for V4 orders, e.g., in Old Sicilian or Old Occitan, since it leaves more positions open for base-generation and movement. Example (74) illustrates the different structures for high and low V2 languages:

(74) a. $[_{\text{FrameP}}\ [_{\text{ForceP}}\ \text{XP}_2\ _{\text{Force0}}\ \text{verb}_1\ [_{\text{TopP}}\ [_{\text{FocP}}\ [_{\text{TopP*}}\ [_{\text{FinP}}\ t_2\ _{\text{Fin0}}\ t_1\ [_{\text{IP}}\ t_2\ t_1]]]]]]]$ *high V2*
b. $[_{\text{FrameP}}\ [_{\text{ForceP}}\ [_{\text{TopP}}\ [_{\text{FocP}}\ [_{\text{TopP*}}\ [_{\text{FinP}}\ \text{XP}_2\ _{\text{Fin0}}\ \text{verb}_1\ [_{\text{IP}}\ t_2\ t_1]]]]]]$ *low V2*[23]

Depending on the position of the verb (high or low), a language can have multiple preverbal elements or only one preverbal element. Wolfe (2015: 139) concludes that if the verb is low,

(i) [Force [Top*[Int [Top*[Foc [Top*[Mod [Top*[Qemb [Fin [IP...]]]]]]]]]]]

[23] There are two competing proposals for the order of ForceP and FrameP/SceneP. The first favors the order ForceP >> FrameP (cf. Poletto 2002, 2005), while the second favors FrameP >> ForceP (cf. Wolfe 2015). Haegemann&Greco (2018: 35, footnote 23) highlight that there is no motivation for either of the two assumptions.

then frame-setter, topic, and focus positions are free for constituents to move to. Alternatively, constituents can first-merge in these positions. Both operations lead to multiple preverbal elements and object-initial V2 with preposed adverbials are expected. In languages in which this is the case, there is a "widespread occurrence of Topic and Focus and the possibility of V4 orders where a Frame-Setter, Topic, and Focus co-occur" (Wolfe 2015: 139). On the other hand, in high V2 languages, multiple preverbal constituents (for example, V3 structures) are supposed to be more restricted. Wolfe (2015: 140) highlights that only constituents that first-merge in FrameP, a designated position for frame-setters, can appear preverbally in these languages, V4 structures are expected to be ruled out. Frame-setters are late-merged and hence not moved from other structural positions within the syntactic tree. V3 is only allowed with frame-initial constituents. Table 35 summarizes the difference between V2 languages.

	Low V2	**High V2**
Verb position	FinP	ForceP
Quantity of preverbal elements	1 – 3 (V2, V3, V4)	1 – 2 (V2, V3)
Quality of preverbal elements	Frame-setter, Topic, Focus	Frame-setter, X

Table 35: Properties of Low and High V2.

German can be considered a high V2 language due to several reasons: There is evidence for a restricted number of constituents in the prefield, i.e., more than two preverbal constituents seem to be rare. V3 structures occur with initial frame-setters, and Adv-O-V_{fin} is unattested in corpora. Additionally, Adv-O-V_{fin} seems to evoke difficulties in sentence processing. Consequently, German would have the subject and the verb in ForceP, allowing only for a frame-setter to be late-merged in FrameP. However, it is questionable why subjects should occur in ForceP in the first place. In order for it to occur here, we would have to rethink the function of ForceP. According to Rizzi (1997), the projection is responsible for clausal type and illocutionary force; functions that subjects cannot fulfill. Consequently, one would have to outsource the encoding of clause type into another projection or assume that the verb would take over these tasks.

Having provided the necessary background information on Generative Grammar, I now turn to the empirically motivated analysis of V3 in German.

5.1.2 An empirically motivated generative analysis of V3

In the generative literature, the major questions concerning V3 are how the preverbal elements get into their positions, where these positions are and whether a cartographic analysis is necessary or whether the traditional non-cartographic approach suffices. In the latter case,

the question of whether the structure relies on asymmetric or symmetric V2 comes into play. In what follows, I discuss these aspects based on the status of V3 and empirical evidence, as discussed in the previous chapters.

5.1.2.1 The status of the preverbal constituents

According to Frey (2006), three operations place constituents in the first position: formal movement, true Ā-movement, and base-generation. Formal movement takes the element from the highest middlefield position and places it in the local prefield (i.e., the prefield of the same phrase), satisfying the EPP feature. This movement operation does not add any information-structural, semantic, or pragmatic content to a constituent. It is thus purely formal and preserves the semantic and pragmatic properties when moved into the prefield.

In contrast, true Ā-movement modifies the meaning of a structure. Frey (2006) shows that long distant movement, e.g., with topics, is always related to a contrastive interpretation and stress assignment. The differences between true Ā-movement and formal movement are illustrated in (75).

(75) Ich erzähl dir etwas über Max:
a. Den Max sollte der Chef mitnehmen
b. Den MAX meint Eva, dass der Chef mitnehmen sollte (Frey 2006: 244)

In (75), *Max* receives stress and is highlighted as a member of a larger group of people. Thus, *Max* stands in contrast with other people. This is not the case in (75). Due to this reason, *den Max* in (75) cannot be the result of formal movement, since formal movement does not add any content in meaning.

As opposed to constituents that are moved via formal movement and true Ā-movement, some initial constituents cannot be moved but are base-generated. This is illustrated in (76) and (77). Suppose all elements were licensed by the same head (i.e., base-generated in the VP and further moved to the periphery). In that case, all constituents should be able to appear in the initial position, keeping a certain reading intact. The sentences in (76), however, are only grammatical with parenthetical readings.

(76) a. *Ich bin am Rande bemerkt etwas enttäuscht von dir
b. *weil jeder Linguist$_1$, wenn sich seine$_1$ Frau nicht irrt, nach Lund reist
c. *Peter spricht kein Wunder so gut Französisch
d. *Ich habe ein Glück den Regenschirm dabei (Frey 2006: 243)

(77) a. Am Rande bemerkt bin ich etwas enttäuscht von dir
b. Wenn seine Frau sich nicht irrt, reist Karl nach Lund
c. Kein Wunder spricht Peter so gut Französisch

d. Ein Glück habe ich den Regenschirm dabei (Frey 2006: 243)

Frey (2006) concludes that the initial phrases in (77) are not licensed by the verb but by C in the C-domain; hence, they are base-generated in this position and do not move here. Frey assumes that an EPP feature triggers c-related adverbials into the preverbal position.

The two options that appear to be at work in V3 structures are base-generation for the adverbial and formal movement for the subject. True Ā-movement does not apply since neither the adverbial nor the subject receives a contrastive reading. In fact, this reading is excluded for the second constituents and the prosodic factor that Frey identifies for true Ā-movement does not apply to the initial adverbial. There is no stress assigned to the adverbial nor to the subject. However, one could argue that frame-setters bring with them a contrastive interpretation. For true Ā-movement in the sense determined by Frey (2006), accent plays a crucial role. Adverbials in V3 do not bear accent.

The fact that prosody plays an important role in V3 is also highlighted by Hinterhölzl (2017). Hinterhölzl (2017) states that frame adverbials are generally not moved from IP into the preverbal region but are base-generated in CP. Evidence comes from the lack of Principle C effects (78) and binding problems between a pronoun and the adverbial clause (78).

(78) a. Als Peter$_i$ nach Hause kam, hat er$_i$ seine Freundin angerufen.
b. *Als er$_i$ Maria traf, war fast jeder Student$_i$ schon nach Hause gefahren.
(Hinterhölzl 2017: 212)

Hinterhölzl assumes a prosodic condition that plays a role in V2, and its absence can explain V3. He assumes that in V2 languages, the verb moves into the C-domain, i.e., it raises to FinP or further up. FinP or higher projections are phase edges. Phase edges need to be reached by constituents to enter other phases, i.e., move further up in the tree to keep movement local. Constituents must move through the phase edge if they are base-generated in IP to get into the C-domain. This limits the numbers of preverbal elements to one since only one element can move through the phase head. Hinterhölzl (2017) assumes that German has a flexible phase edge, meaning that verb movement into the head of the phase signals the edge of a phase. Optionally, prosody conditions can determine phase heads in addition to verbs. One of the crucial points in Hinterhölzl's analysis is that topics move from an IP-internal position and trigger verb movement to ForceP. Hinterhölzl argues that a prosodic condition for German is responsible for a "superficial appearance" of high V2 in standard German and that this condition "forces verb movement into ForceP even in the absence of movement of a clause internal constituent into the C-domain" (Hinterhölzl 2017: 213):

(79) *Interface condition on the determination of the phase edge (ICPE):*
V_{fin} must occupy a left-peripheral position in its prosodic phrase in the phase head.
(Hinterhölzl 2017: 213)

Hinterhölzl (2017: 213) supports the ICPE stating that topics and adjuncts "are mapped onto separate phonological phrases from the verb, while arguments are mapped into the phonological phrase of the verb". It follows that the adverbial and the subject form two prosodic constituents and the adverbial is base-generated in the C-domain:

(80) [ForceP (Frame) [FinP ((Subj) V_{fin}) .....]] (Hinterhölzl 2017: 213)

Since the adverbial is a base-generated frame-topic, the verb does not move to $Force^0$ but, along with the subject, stays in FinP. However, the prosodic phrases violate the ICPE, which states that the verb must move to the head of ForceP, which is the left-peripheral position in the prosodic phrase of the verb in the phase edge. Hinterhölzl solves this problem in assuming that the subject or the adverbial is analyzed as a discourse linker[24], which is located in SpecForceP with V_{fin} moving to $Force^0$ in order to fulfill the ICPE. Hence, the subject and discourse linker are both in the separate phonological phrase from the verb, and the verb is in "a peripheral position in its prosodic phrase in the phase edge." (Hinterhölzl 2017: 214).

(81) [ForceP (Subj / Frame) (Vfin) [FinP ...]]

Hinterhölzl argues that Kiezdeutsch and earlier stages of German have not incorporated the ICPE, which allows for V3 with base-generated material in the first position. The major problem with this account is that contemporary monolingual German does indeed exhibit V3, as the previous chapters have shown. Therefore, ICPE should not be at work in all varieties of German that exhibit V3. The second problem is that varieties that have V3 also have V2, and V2 declaratives are even more frequent than V3. Hence, one needs to define under which conditions ICPE applies and when it does not. Interestingly, Hinterhölzl's approach could still explain V3: Some instances of V3 lack a pause between the adverbial and the subject. Pauses are assumed, among other factors, to signal prosodic phrases (cf. Ulbrich 2006 for an overview of the research done on prosodic phrasing in German). The ICPE would be intact since if the frame-setter and the topic form one prosodic phrase, they leave the verb in the left periphery of its prosodic phrase in FinP. However, one would have to assume an additional position for the frame-setter.

[24] Hinterhölzl (2017) uses the term discourse linker in a broad sense, namely, elements that link a constituent to the preceding context in some way, which also includes topics.

A second account that argues for base-generation of the initial adverbial is provided by te Velde (2016). te Velde (2016) assumes that the fronted temporal adverbial in V3 is base-generated and late-merged, i.e., it adjoins to the structure after the derivation of V2 has been completed, giving rise to (82).

(82) [$_{TP}$ gestern [$_{TP}$ isch$_1$ war$_2$ [$_{VP}$ t$_1$ t$_2$ Ku'damm t$_2$]]]

The adverbial is not moved because temporal adverbials are "closely associated with the TP domain" (te Velde 2016: 316). This means that, in contrast to elements related to the VP domain, such as verb arguments or other adverbs, temporal adverbs do not create a chain formation to their base position in the VP. Due to the lack of chain, the verb does not have to rise, and no accent is assigned. Instead, temporal adverbs are late-merged in TP. te Velde's (2016) analysis is not completely compatible with empirical data. As the previous sections have shown, the adverbial position is not restricted to temporal adverbials. Furthermore, te Velde (2016) proposes that Kiezdeutsch might be a language in which temporal adverbials have a special status since they are responsible for encoding tense that is morphologically absent. Evidence, he argues, comes from sentences such as (83):

(83) Letztes Jahr isch geh nach Bosnien.

This would indicate a close relationship between temporal adverbs and the TP only in Kiezdeutsch. However, monolingual non-standard German also allows for this configuration, even with V3, see (84):

(84) Und den einen morgen ich werde wach und die Sonne scheint mir voll ins Gesicht.
[BSa-OB #31]

If one assumes a special relationship of the temporal adverbial with the TP, then this relationship is not only active in Kiezdeutsch but in informal German in general. Hence, V3 is not different in both varieties. Even though corpus studies and the acceptability judgment task have shown that the initial position is not restricted to temporal adverbials, the self-paced reading study showed that temporal adverbials are indeed preferred in Adv-X-V_{fin} in terms of processing the preverbal constituent. However, the effect was not restricted to Adv-S-V_{fin} but also occurred in unattested Adv-O-V_{fin}. This might indeed point to a special status of preverbal temporal adverbials. However, this special status does not necessarily have to do with syntax but could be due to the preferred function of initial adverbials: They preferably function as frame-setters, and temporal, as well as local adverbials are prototypical frame-setters. As there

is, to the best of my knowledge, no research focusing on preferences of different frame-setters in terms of processing, temporal adverbials might generally be preferred as frame-setters.

From the studies above, late-merge/base-generation of the adverbial appears likely, but are there arguments against movement and is there empirical evidence for the fact that the initial adverbial functions as a frame-setter, as has been stated on the basis of corpus data? The reading time experiment could answer these questions: The semantic class of the adverbial did not influence RTs of the different conditions in the overall processing. An effect was only found at the immediate preverbal constituent. This indicates that temporal adverbials and, to a lesser extent, local adverbials facilitate the processing of the preverbal constituent in V3, which is in line with corpus data. Here, the vast majority of the initial adverbial was temporal or local. In addition, the effect of the temporal adverbial was only present in V3 but not in V2. Since temporal and local adverbials are prototypical frame-setters, whereas modals are not, this indicates that the initial element is indeed interpreted as a frame-setter in Adv-X orders. The fact that there was no effect for V2 sentences suggests that the frame-setting function is particularly prominent in V3 sentences, whereas in V2 modal adverbials can occur to the same extent as temporal and local adverbials. This does not mean that frame-setters do not occur in V2, but in V2 initial adverbials can have other functions that modal adverbials can fulfill, e.g., they can be contrastive. This is not possible in V3. Hence, topicalization or assigning contrast to the adverbial is an option in V2, while the second constituent in V3 prefers preceding frame-setting adverbials over topicalized adverbials. However, the fact that initial modal adverbials also occur in V3 must not be ignored. Störzer & Stolterfoht (2013) argue that the surface position of an adverbial influences its interpretation. Thus, modals can receive a frame-setter interpretation if they occur in the initial position, even though modals are not prototypical frame-setters.

This brings us to the status of the adverbial in terms of movement or base-generation. As studies concerning the movement of arguments and verbs have shown, movement and the reconstruction of base positions via traces are reflected in differences in reading times (cf. Clahsen & Featherston 1999, Freitag 2019). In the literature, there is evidence that adverbials have base positions from which they can be moved like arguments (Frey 2000) or complements and specifiers (Alexiadou 1994, 1997). Störzer & Stolferfoht (2013) and Stolterfoht et al. (2019) put forward empirical arguments for base positions of adverbials and for the differences between arguments and adjuncts in sentence processing.

As far as I am aware, there is no designated study concerning the reconstruction of potential base positions of adverbials that have been moved into the left periphery. If different adverbial types are base-generated in different syntactic positions and if they need to be reconstructed in different positions in the syntactic tree, this should lead to reading time differences. In particular, preverbal modal adverbials should evoke higher RTs because they are more related to constituents within VP where they need to be reconstructed. On the other hand, temporal and local adverbials are prototypical frame-setters and are related to the whole clause. Hence, they do not necessarily need to be reconstructed because they set a frame for the whole sentence. If moved modal adverbials lead to higher RTs due to reconstruction effects, then this would mean that an effect of the semantic class of the adverbials would appear in other positions in the clause, namely in possible base positions near the VP. However, no such effect has been found. The observations point to the late-merged or base-generated frame-setting adverbials that are not moved from any other position within the clause. In order to further support these findings, priming experiments with adverbials following the work of Clahsen & Featherston (1999), who test the movement of arguments in priming studies, may provide more evidence.

5.1.2.2 Subject-restriction in the second position

There is a general agreement in the literature that the direct preverbal constituent is moved to its position. In principle, this option is open for subjects as well as objects. However, in V3 the question of why the second position is restricted to the topical subject is crucial. If in a high V2 language such as German, a topical element moves to ForceP, then the model also predicts that objects appear in the second position after the frame-setter. Nothing prevents an object from being topicalized via a topic.

According to the bottleneck in the cartographic approach, a constituent moves through FinP, blocking further movement of other elements and then moves further up to another phrase, such as TopP. As for West Flemish, the model correctly accounts for preverbal objects in V3 because in West Flemish V3 with preverbal objects is accepted by some speakers. However, as the corpus data, as well as the experimental data above show, Adv-O-V_{fin} is not an option in German. A purely syntactic explanation is Relativized Minimality (Rizzi 2001). The principle does not allow for Adv-O-V_{fin} because the base position of the subject intervenes between the base position of the object and its target position. This would then go against minimal configuration, and thus Adv-O-V_{fin} is excluded. However, there are also empirical arguments for the subject restriction.

As indicated above, te Velde (2016) assumes that in Adv-S-V_{fin} there is no pitch accent on either of the preverbal constituents. Thus, the preverbal constituents are not the result of topicalization. Topicalization usually involves a fronted element, which moves into a higher position in order to check a topic feature. This movement operation usually causes the verb to rise together with the moved constituent because the verb has to check the feature for pitch accent realization with the fronted element. PF then interprets this configuration between the fronted element and the verb. This process then ends up in a V2 order with a topicalized constituent. Thus, te Velde assumes, following Féry (2007), that pitch accent signals that an element has been moved and this constituent receives a contrastive interpretation. In Adv-S-V_{fin}, there is no indication of topicalization to be involved. If an object occurred here, this object would automatically be interpreted as a contrastive topic. As has been illustrated in the corpus study earlier, the topic position is restricted to continuing, familiar, and aboutness topics. The second position is thus not accessible for accented constituents, i.e., contrastive topics. The data concerning the status of V3 suggest that contrastive topics are not preferred in V3: In the acceptability judgment task, Adv-O-V_{fin} was rated significantly less acceptable than Adv-S-V_{fin} and the processing experiment revealed that the parser has difficulties in processing constituents that follow the object. These difficulties did not occur in processing object-initial V2, and thus OV cannot be the source of the processing difficulties. Following Krifka & Musan (2012), a reason for why frame-setters and contrastive topics cannot occur together could be that frame-setters have a contrastive reading in the sense that they set a frame in contrast to other possible frames. Hence, two contrastive elements directly following each other might cause interpretation problems for the parser.

The evidence provided above now allows us to draw conclusions for the syntactic structure of V3 in the generative framework.

5.1.2.3 The syntactic structure of V3

As indicated in the previous sections, there are two possibilities for modeling the structure of V3 in the generative framework. V3 can be modeled in either the cartographic approach or in the non-cartographic approach. The cartographic approach offers mechanisms that allow preverbal constituents with specific functions and information-structural properties to occur in these positions. However, as the data indicate, a cartographic approach must also account for the specific constitution of V3 structures. It must allow for all kinds of initial adverbials that function as frame-setters and discourse markers; it must account for the subject restriction in

the second position; and it must account for the fact that only familiar, continuing, or aboutness topics are allowed in this position. A structure that captures these aspects is provided by Freywald (2018). Freywald (2018) argues for a cartographic approach in V3 with a designated continuing topic position:

(85) [$_{ForceP}$ [$_{FrameP}$ ab jetzt [$_{ContinTopP}$ ich$_j$ [$_{FinP}$ t_j krieg$_i$ [$_{TP}$ t_j immer zwanzig EUro t_i]]]]]]

(85) is based on approaches to the syntactic structure of V3 in Early New High German (Speyer 2008: 282):

(86) Early New High German (Speyer 2008: 482)
[ForceP [SceneP [FocP [TopP [FinP [IP …]]]]]]

It is worth noting that Freywald does not argue for base-generation or movement of the frame-setter. The advantage of this approach is that it restricts possible topic types that can occur in V3. Subject continuing topics would move to this position, but the topicalized object would not because they would require a contrastive interpretation in the respective functional projection ContrTopP. The reading time data would account for designated topic positions. Adv-O-V_{fin} displays significantly slower reading times on the verb compared to Adv-S-V_{fin}, while preverbal subjects were read slower than preverbal objects. In the subject position with continuing and aboutness topics, the adverbial might be reinterpreted as the frame-setter in FrameP, leading to higher reading times at the subject compared to the object. The subject would then predict the verb to occur in a lower head position in the structure. Contrastive objects would not trigger such an interpretation and anticipation, since there is no FrameP >> ContrTopP >> FinP structure. For that reason, verbs in Adv-S-V_{fin} are read faster than verbs in Adv-O-V_{fin}.

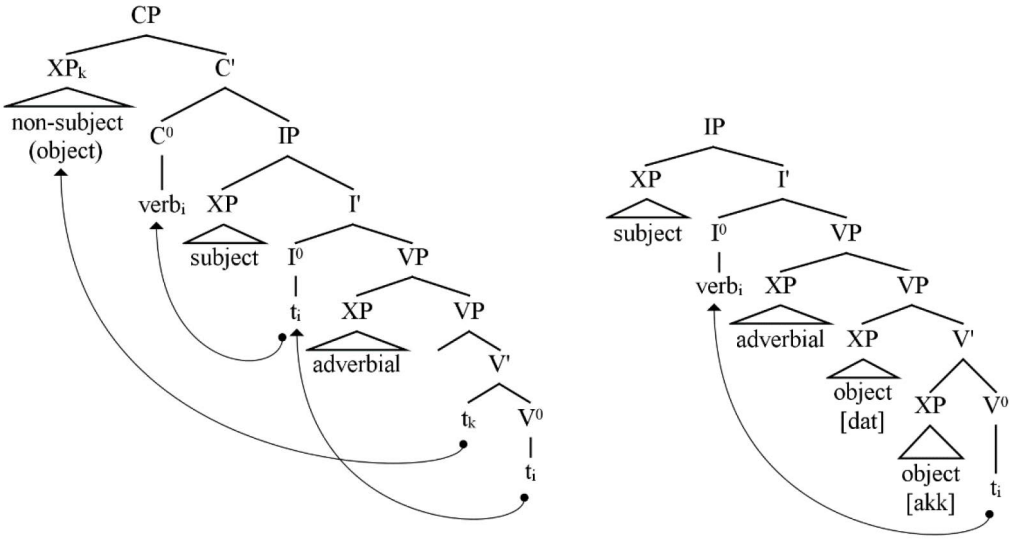
However, Freywald's (2018) analysis presumes that German is a low V2 language, placing the verb in FinP. One then needs to explain why no more constituents can precede the verb. A bottleneck in FinP could account for this so that the subject moves through SpecFinP blocking other constituents to move further up the tree. The initial adverbial would then need to be base-generated and late-merged in the initial position. The restriction to non-contrastive topics leads to a fundamental question also raised by te Velde (2016): Is a designated topic position needed or do subjects in the left periphery fulfill their prototypical topic function by default (cf. Chafe 1987, Gundel 1998, Lambrecht 1994)? If the latter is the case, then there would be no need for a cartographic approach to Adv-S-V_{fin} since the subject would not require a designated topic position. This position would, by default, only be open for non-contrastive subject topics. The adverbial would adjoin to CP.

For a non-cartographic analysis of V2 in German, two assumptions concerning the clause structure have been put forward:

a) Symmetric V2: German V2 sentences always have a CP
b) Asymmetric V2: German V2 sentences have a CP if a subject appears in the first position. Otherwise, German only has an IP.

The symmetric analysis states that in subject-initial clauses, the subject moves from SpecIP to SpecCP, while the verb moves from (V^0 to) I^0 to C^0. From the perspective of linearization, moving the subject to SpecCP and the verb to C^0 seems to be redundant (as is also advocated by Zwart 1993: 78 for Dutch) because the subject-verb order is already intact at the IP-level, where subject-verb-agreement is realized. Thus, one might argue that the symmetric analysis violates the economy of derivation and economy of representation principles in Chomsky's minimalist program (Chomsky 1995). As opposed to subjects, non-subjects are not base-generated in SpecIP, the immediate preverbal positions. For that reason, they need to move to the initial position SpecCP, while the subject stays in SpecIP. Another argument against the symmetric approach is that it is not clear how CPs are learned in language acquisition. There is no reason for the learner to assume two movement operations of the verb and the subject, which then results in the same surface structure. The tree structures in (87) illustrate the derivation of subject and non-subject-initial clause in the asymmetric analysis.

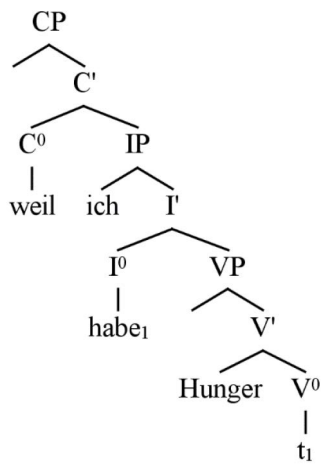
(87)



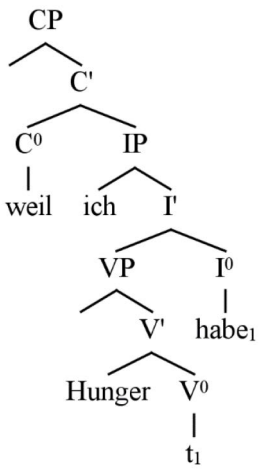
The asymmetrical analysis causes serious problems for German. The examples in (87) illustrate a structure with a right-headed IP and VP. For German, however, there is evidence that IP and VP are right-headed since German is known to be underlying SOV, which is

especially apparent in subordinate clauses (see Müller in prep: 6-10 for a comprehensive overview of arguments for SOV as the underlying structure in German):

(88) !



(89)



Even though sentences such as (88) exist, they have a different function than their VL counterparts and, thus, a different structure (cf. Freywald 2018). The tree in (88) would be an inappropriate analysis of a subordinate clause since the verb does not appear in the last position. Hence, one would have to assume flexible headedness in the IP. The IP would be left-headed in main clauses, and in subordinate clauses, the IP would be right-headed. Otherwise, asymmetry would make the correct predictions for matrix clauses and subordinate clauses without complementizers but incorrect predictions for embedded clauses with complementizers.

There are numerous arguments by many scholars for and against asymmetry and symmetry[25]. Within the scope of the thesis, I only provide one relevant argument for the structure of V3 sentences in the context of asymmetric versus symmetric analyses of V2. For a detailed discussion, see Schwartz & Vikner (1989) and Schwartz & Vikner (1996). The argument that I will briefly discuss is developed in Schwartz & Vikner (1996: 12 – 13) and it is presented as an argument for symmetric V2. However, the argument turns out to be the direct opposite, namely an argument for asymmetric V2. The argument is even stronger when considering empirical data concerning V3 sentences. Schwartz & Vikner (1996: 12 – 13) observe that certain adverbials that appear left to the subject in SpecIP, must be adjoined to IP:

[25] Arguments in favor of the symmetric account are provided by, among others, den Besten (1977. 1989), Kayne (1982), Platzsack (1983), Kolmberg (1986), Holmberg & Platzack (1995), Vikner (1995), Schwartz & Vikner (1989, 1996) and Van Craenenbroek & Haegeman (2007). Meanwhile, researchers such as Travis (1984, 1986, 1991), Rheinholtz (1989), Zwart (1991, 1993, 1997, 2001), and Mikkelsen (2015) argue for the asymmetric account.

(90) [$_{CP}$ Dieses Buch hat letzte Woche [$_{IP}$ Peter tatsächlich gelesen]]
(Schwartz & Vikner 1996: 12)

In (90), the subject *Peter* sits between two adverbials, which can be motivated by assuming that *Peter* is situated in SpecIP. If the subject stays in SpecIP in subject-initial declaratives, as the asymmetrical account assumes, then adjunction to IP should, in principle, be possible. According to Schwartz & Vikner (1996), such sentences are ungrammatical, as (91) illustrates.

(91) *Letzte Woche [Peter hat tatsächlich ein Buch gelesen]
(Schwartz & Vikner 1996: 13)

On the other hand, assuming the subject in SpecCP correctly predicts that (91) is ungrammatical because an adverbial cannot adjoin to CP. The same should hold for non-subject-initial clauses:

(92) *Letzte Woche [$_{CP}$ ein Buch hat [$_{IP}$ Peter tatsächlich gelesen]]
(Schwartz & Vikner 1996: 13)

Interestingly, (91) is the attested V3 structure that is reported in German, and (92) is the unattested V3 structure in the form of (Adv-O-V_{fin}). Hence, taking empirical data into account, both examples speak for an asymmetric account with IP adjunction giving rise to Adv-S-V_{fin} sentences. Still, this would not rule out the above-mentioned fundamental problem with the asymmetric account concerning the headedness of IP and VP in German. Additionally, adjunction on IP or CP would allow for not only V3 but potentially V>3 serializations. The preverbal area thus needs to be restricted in terms of how many and which elements can occur here. Corpus data and the experiments presented above provide empirical evidence for robust restrictions that are at work in Adv-S-V_{fin}. Therefore, adjunction to IP does not seem to be an appropriate analysis. If we assume a symmetric structure, the adverbial would adjoin and base-generate on CP. This would solve the problem of the headedness but not of V>3 orders.

Is seems that a cartographic approach with a designated position for continuing, familiar, or aboutness topics that can host the preverbal subject and the base-generated adverbial in a designated FrameP can be used to model V3 adequately. Walkden (2017) formulates an account that somewhat combines cartography and non-cartography. Walkden (2017: 62 – 65) provides an analysis along the lines of the cartographic account but without the dissolution of the CP layer. He proposes the following structure for V3 in Kiezdeutsch:

(93) [$_{CP2}$ morgen [$_{CP1}$ Ich [$_{C}{}^{0}$geh [$_{TP}$ Arbeitsamt]]]]

CP1 includes FinP and FamP, a layer that hosts familiarity topics (see Frascarelli and Hinterhölzl 2007). CP2 combines the layers between FocP and ForceP. Thus, CP1 and CP2 differ in information-structural purposes. (94) illustrates the structure proposed by Walkden (2017: 62):

(94) Frascarelli & Hinterhölzl (2007): [ForceP [ShiftP [ContrP [FocP [FamP [FinP …]]]]]]
Walkden (2017) [CP2 [CP1]]

Frascarelli & Hinterhölzl (2007) do not include frame-setters in their analysis. However, as mentioned earlier, contrastive topics might be considered frame-setters (cf. Krifka 2007: 45 – 46). In his analysis, Walkden proposes that the CP layer is not recursive, but a functional projection and that CP1 can only be filled when a topic feature is checked. CP2 can host "at least focus and some (high) types of topic" (Walkden 2017: 63), including scene-setting elements, and bears an edge feature, which triggers elements to SpecCP2 via formal movement. Following te Velde (2016), Walkden assumes that adverbial elements late-merge in SpecCP2 whereas arguments do not. Arguments receive their theta-role below CP1 while adverbials do not, which is why arguments cannot late-merge and must move. Objects are not allowed in the second position due to Relativized Minimality.

The consideration so far suggests that the generative framework can account for the status of V3 declaratives. This is possible from both the cartographic and the non-cartographic approach. However, we have not yet considered the fact that V2 and V3 differ in acceptability. Suppose the derivations of both structures are legitimate. In that case, both structures should be equally acceptable in the right contexts, similarly to V2 structures that need the right context to be interpreted as acceptable. The generative account so far did not consider specific requirements for V3 apart from the context that needs to allow for aboutness, continuing, or familiar topics. However, with Optimality Theory, it is possible to model different degrees of grammaticality within Generative Grammar, taking into consideration more properties of V3. Even though Optimality Theory aims to give only one optimal output among many candidates, it bears the potential of modeling differences in grammaticality.

5.1.2.4 V3 in Optimality Theory

OT is a generative model, developed in Prince & Smolensky (1993). It was first developed for phonology (among others cf. Kager 1999) but later applied to syntax as well (cf. Grimshaw 1997, Müller 2000). The model consists of the universal components GEN (Generator), CON (Constraint development), and EVAL (Evaluator). GEN generates a list of possible candidates

(structures) for the output, CON provides the relevant ranked constraints, and EVAL chooses the optimal output based on the ranking of the constraints. The structure that violates the least constraints is the optimal candidate and is chosen.

Many generative OT-approaches on word order variation in German concern the middle field (see Müller 1999, Jacobs 1988); meanwhile, the prefield has yet not been in focus. Winkler (2017) provides an optimality theoretical approach to apparent multiple constituents in the prefield that is very promising in modeling Adv-S-V_{fin} structures. An example for an apparent multiple prefield construction is given in (95):

(95) Zum zweiten Mal die Weltmeisterschaft errang Clark 1965. (Beneš 1971: 162)

Müller (2003, 2005) provides an extensive analysis of these structures and a detailed description of different types of apparent multiple prefield constituents. The data are a highly valuable source in describing and analyzing complex prefields in different grammatical frameworks. Within the scope of this dissertation, I am not able to discuss Müller's (2005) analysis in detail but will focus on an OT-analysis developed in Winkler (2014, 2017).

Winkler (2017) observes that constructions with apparent multiple prefield constituents compete with their V2 equivalents since they are mutually interchangeable. Winkler argues that V2 is not a rigid constraint in German but participates in the competition for the optimal output just as any other grammatical constraint. Winkler bases her analysis on the constraints adapted from Jacobs (1988) for the German middlefield. Winkler (2017) adds three constraints that concern the subject, information distribution, and V2:

Constraint	**Description**	**BZ**
Accent	The main accent of a sentence is in the middlefield preferably at the right edge	1
Definiteness	Definite elements precede indefinite elements in the prefield and the middlefield	2
Object	Indirect objects precede direct objects in the prefield and the middlefield	2
Hierarchy	If there are multiple elements in the prefield, the following hierarchy applies: Set >> Frames >> Sentence themes	2
Subject	The subject precedes elements with a different grammatical relation to the verb	3
Nominative	The subject stays in the middlefield or solely occupies the prefield.	3
Information distribution	The information is distributed over the prefield and the middlefield. There are two options for the distribution (Info1 or Info2)	4

INFO1	Thematic and rhematic information are separated via distribution over prefield and middlefield	4
INFO2	Similar information (rheme and rheme) is separated via distribution over prefield and middlefield	4
V2	There is only one constituent in the German prefield	5

Table 36: Constraints participating in sentences with multiple prefields (Winkler 2017: 153).

ACCENT is not relevant if the main accent is in VF. DEFINITENESS does not operate over different topological fields; hence, it is only relevant if definites and indefinites occur in the field. HIERARCHY includes frames and themes that, in principle, are understood as the concepts introduced in section 2.5. Even though topic is a concept that is heavily involved in apparent multiple prefields, Winkler (2017) considers this concept to be problematic, and therefore she explicitly refrains from including it in her analysis. Instead, she establishes a broad understanding of the term *Gesprächsthema* ('theme of discourse'), which is to be understood in a colloquial sense, i.e., it includes thematic and rhematic elements. In distinguishing between theme and rheme, the occurrence of an antecedence is of major importance. A theme, as Winkler (2017) defines it, is a referent that has been mentioned in the previous discourse, and that is picked up through another element. A rheme, on the other hand, is an element that is newly introduced; hence, there is no element referring to it. According to INFORMATION DISTRIBUTION, theme and rheme are distributed over prefield and middlefield. Their distribution is restricted. If a sentence hosts two rhemes, one of them occurs in the prefield and the other one in the middle field. In a sentence with a theme and a rheme, both can occur in both fields. In a sentence that hosts a theme and two rhemes, the prefield hosts either theme and rheme or only the rheme. In the former case, the rheme is situated in the middlefield; in the latter case, theme and the second rheme occur in the middlefield. These observations are summarized in Table 37.

Configuration		**Prefield**	**middlefield**
2 rhemes	INFO2	Rh	Rh
1 theme, 1 rheme	INFO1	Th	Rh
		Rh	Th
		(Frame)	Th+Rh*
1 theme, 2 rhemes	INFO2	Th+Rh	Rh
		Rh	Th+Rh

Table 37: Cases of information distribution based on Winkler (2017: 153 – 154).

The constraints in Table 36 are evaluated and ranked in the following way: Each constraint receives a BZ (*Bewertungszahl*). The number of possible violations of each constraint in the sentence under discussion is multiplied by the BZ of that constraint. Then the results for each

constraint are added up. This gives the maximum rating that is being put in relation to the actual rating. Winkler (2017: 154) exemplifies her model with the following sentence (taken from Müller et al. 2012):

(96) Dem Saft eine kräftigere Farbe geben Blutorangen […]

Table 38 shows which constraints are relevant and how they are rated.

Constraint	**BZ**		**Maximal violations**	**Rating per constraint**
Definiteness	2	×	1	2
Object	2	×	1	2
Hierarchy	2	×	1	2
Subject	3	×	2	6
Nominative	3	×	1	3
Information distribution (Info2)	4	×	1	4
V2	5	×	1	5
Maximal Rating				**24**

Table 38: Maximal ratings for the sentence "Dem Saft eine kräftigere Farbe geben Blutorangen […]" according to Winkler (2017: 156).

The sentence in question is then analyzed according to the satisfaction of the constraints. It receives the full rating for each constraint if there is no violation of this constraint. In other words, if there is no violation of a constraint, it gets the same rating as in column "Rating per constraint" in Table 39. It loses points according to the number of violations. The sentence in (96) satisfies all constraints except the V2 constraint. Hence, it receives the following points.

Constraint	**BZ**		**Satisfied constraint**	**Rating per constraint**
Definiteness	2	×	1	2
Object	2	×	1	2
Hierarchy	2	×	1	2
Subject	3	×	2	6
Nominative	3	×	1	3
Information distribution (Info2)	4	×	1	4
V2	5	×	0	0
Actual Rating				**19**

Table 39: Maximal ratings for the sentence "Dem Saft eine kräftigere Farbe geben Blutorangen […]" according to Winkler (2017: 156).

Winkler (2017) then calculates the acceptability of the structures and proposes the four classes: * *unacceptable*, *?? almost unacceptable*, *? restricted acceptable*, *acceptable*[26]. She divides the maximal rating by four in order to provide the spectrum within which sentences can be situated. For (97), the rating is as follows:

[26] i.O. Winkler (2017: 157): * inakzeptabel, ?? wenig akzeptabel, ? eingeschränkt akzeptabel, akzeptabel.

(97) 0 – 6 points: *unacceptable
7 – 12 points: ??almost unacceptable
13 – 18 points: ?restricted acceptable
19 – 24 points: acceptable

Winkler (2017) highlights that her analysis does not refute that German is a V2 language but that V2 is a constraint that participates in calculating the optimal output. She further argues that the contexts that would allow for V3 are much more restricted than for V2, which is the reason why V2 would, in most cases, be the first choice for the speaker. Winkler's (2017) model allows for explaining why V3 was much more common in earlier stages of German: While the BZ for the V2 constraint is comparably high in contemporary German, namely 5, this number could have been smaller in earlier stages, so that V3 could have been the more optimal output.

Let us examine whether Winkler's (2017) method is adaptable to Adv-S-V_{fin} sentences. Consider the following sentences that should function as examples:

(98)	a. Letztens er hatte richtig HUNger.	AS-V3	[BSa-OB #22]
	b. Letztens richtig HUNger hatte er.	AO-V3	
	c. Letztens hatte er richtig HUNger.	A-V2	
	d. Er hatte letztens richtig HUNger.	S-V2	
	e. Richtig HUNger hatte er letztens.	O-V2	

The constraints are relevant as follows: ACCENT is only relevant if the main accent is in the middlefield and if more than one element occurs here (as in (98c, d)). DEFINITENESS is not relevant for (98)) since no indefinite or definite elements are present in the same field. OBJECT is not relevant for all sentences in (98) since only one object is present in each sentence. HIERARCHY is always relevant if the prefield is filled (cf. Winkler 2017: 155), hence for all sentences in (98). NOMINATIVE is relevant in all sentences. INFORMATION DISTRIBUTION is relevant with INFO1. I assume that anaphorical pronouns refer to an element mentioned in the previous context. Consequently, *er* is the theme, while *richtig Hunger* is the rheme. In all sentences, except for (98c), theme and rheme are placed in separate fields. V2 is relevant if the prefield is filled; therefore, it is relevant for all sentences in (98). The maximal ratings for the sentences in (98) are shown in Table 40 – Table 44.

"Letztens er hatte richtig HUNger." (AS-V3)

PZ	PZmax	$Accent_1$	$Definite\text{-}ness_2$	$Object_2$	$Hierar\text{-}chy_2$	$Subject_3$	$Nomi\text{-}native_3$	$Info_4$	$V2_5$
6	14	/	/	/	2 of 2	/	0 of 3	4 of 4	0 of 5

Table 40: Predicted ratings for the sentence "Letztens er hatte richtig HUNger." according to the competition model (Winkler 2017).

"Letztens richtig HUNger hatte er." (AO-V3)

PZ	PZmax	Accent$_1$	Definite-ness$_2$	Object$_2$	Hierar-chy$_2$	Subject$_3$	Nomi-native$_3$	Info$_4$	V2$_5$
6	14	/	/	/	2 of 2	/	0 of 3	4 of 4	0 of 5

Table 41: Predicted ratings for the sentence "Letztens richtig HUNger hatte er." according to the competition model (Winkler 2017).

"Letztens hatte er richtig HUNger." (A-V2)

PZ	PZmax	Accent$_1$	Definite-ness$_2$	Object$_2$	Hierar-chy$_2$	Subject$_3$	Nomi-native$_3$	Info$_4$	V2$_5$
13	17	1 of 1	2 of 2	/	2 of 2	/	3 of 3	0 of 4	5 of 5

Table 42: Predicted ratings for the sentence "Letztens hatte er richtig HUNger." according to the competition model (Winkler 2017).

"Er hatte letztens richtig HUNger." (S-V2)

PZ	PZmax	Accent$_1$	Definite-ness$_2$	Object$_2$	Hierar-chy$_2$	Subject$_3$	Nomi-native$_3$	Info$_4$	V2$_5$
14	14	/	/	/	2 of 2	/	3 of 3	4 of 4	5 of 5

Table 43: Predicted ratings for the sentence "Er hatte letztens richtig HUNger." according to the competition model (Winkler 2017).

"Richtig HUNger hatte er letztens." (O-V2)

PZ	PZmax	Accent$_1$	Definite-ness$_2$	Object$_2$	Hierar-chy$_2$	Subject$_3$	Nomi-native$_3$	Info$_4$	V2$_5$
14	14	/	/	/	2 of 2	/	3 of 3	4 of 4	5 of 5

Table 44: Predicted ratings for the sentence "Richtig HUNger hatte er letztens." according to the competition model (Winkler 2017).

The ratings for the sentences are:

(99) 0 – 3.5 points: *
3.6 – 7 points: ?? letztens richtig hunger hatte er, letztens er hatte richtig hunger
8 – 10.5 points: ?
10.6 – 14 points: ✓Richtig HUNger hatte er letztens, Er hatte letztens richtig HUNger

(100) 0 – 4.5 points: *
4.6 – 9 points: ??
10 – 13.5 points: ? letztens hatte er richtig HUNger
13.6 – 17 points: ✓

The ratings illustrate that Winkler's (2017) model overall makes correct predictions for V2 sentences, which are equally acceptable. However, the difference between A-V2 and the other structures are not predicted by the model. In fact, A-V2 is predicted to be rated less acceptable than the other V2 structures. A possible reason is the lack of context and text type, which contribute to the preference of elements in the prefield. Hence, the model does not consider external factors that go beyond grammatical and information-structural constraints. In addition, the model does not consider the preference of specific adverbials, for example, frame-setting adverbials in the prefield. The model makes the correct predictions for the difference between V2 and V3. Interestingly, both V3 sentences are predicted to be "almost unacceptable," while in the acceptability judgment task, AO-V3 received an unacceptability rate of 6.53 out of 7. AS-V3 was rated significantly better (5.99). Ultimately, it seems that the model could benefit from including more constraints, especially for V3, or modifying some of the constraints in order to account for a finer differentiation between V3 sentences. This could include a specification of the HIERARCHY constraint.

This section provided evidence for a generative analysis of V3. I showed that empirical findings concerning the status of V3 are compatible with previous analyses of the structure. However, the generative analysis cannot capture several aspects of V3. First, even though the data speak for base-generation/late-merge of the initial adverbial, all of the mentioned studies see initial adverbials in V3 as either discourse linkers or frame adverbials. The studies provide only one analysis and the fact that the initial adverbial has more than one function is not considered. In addition, the initial adverbial can also function as both frame-setter and discourse linker, which is not addressed in the analyses either. Generally, it appears challenging that one unified structure can model the frame-setting function, the discourse-linking function, and the hybrid function of the initial adverbial. A more general problem seems to be that generative approaches to discourse markers are rare (cf. Aijmer 2002, but see Urgelles-Coll 2010 for a generative analysis of *anyway*). A second problem is the assumption that V3 is to be explained with mechanisms that hold for V2. This perspective does not capture the status of V3 as a declarative, but it regards V2 derivation as the central account on which the derivation of V3 is to be adjusted. Third, V3 is only acknowledged to be a phenomenon in Kiezdeutsch but not in standard German. However, the data suggest no difference in the structure of V3 in both Kiezdeutsch and standard German apart from frequency. While one could argue that Kiezdeutsch has its own dialectal syntactic features, this would miss the point that V3 occurs

in standard German but only in the informal register. Fourth, the analyses presented above center very much on syntax. Information structure and prosody are reflected in the syntactic structure and V3 is seen as a syntactic phenomenon. However, information structure has a much stronger impact than the generative analysis suggests.

These problematic aspects concern the basic assumptions of Generative Grammar, including the mental representation of structures and grammar. Hence, it might be very fruitful to test other options in modeling V3 in a framework that makes completely different assumptions. Such a framework is to be found in Construction Grammar, which I present in the next section.

5.2 The construction-based approach

Neither word order variation nor V2 has been a major research topic in Construction Grammar. Therefore, the chapter can provide relatively little background information concerning these topics. The major questions that concern the modeling of V3 in a construction-based approach in this chapter are:

1) Are V3 structures constructions in their own right, or are they the result of the combination of several constructions at work?
2) How is V3 represented in a construction network?
3) How is a V3 construction processed?

In my analysis, I focus on those accounts in Construction Grammar that deal with the psychological plausibility of constructions. Therefore, I discuss V3 in Cognitive Construction Grammar, following Goldberg (1995, 2003) and Jackendoff (1997, 2002). Both accounts differ in some aspects, especially in the question of whether all constructions have meanings. However, I draw from both perspectives since both accounts are, in their essence, well compatible. While Goldberg's detailed discussion on what a construction is allows for conclusions concerning the status of V3 as a construction in German, Jackendoff (1997, 2002) provides a detailed description of the architecture of language in the cognitive system. In addition, his account allows for a straightforward formalization of constructions. For these reasons, I draw from both accounts, Goldbergian Cognitive Construction Grammar and Jackendoff's Tripartite Parallel Architecture. Finally, I discuss the processing of V3 based on Jurafsky (1992, 1996). I start by very broadly providing the necessary background information about Cognitive Construction Grammar and the Tripartite Parallel Architecture, before turning to empirically motivated construction-based analysis of V3 declaratives.

5.2.1 General assumptions

5.2.1.1 Construction Grammar versus Generative Grammar

Construction Grammar was developed in the 1980s pioneered by Lakoff's (1977) highly influential work. It is a grammatical approach that does not assume the existence of grammatical rules that language users apply in the production of utterances. Instead, the grammatical system consists of various constructions varying in the degree of abstractness. Construction Grammar is greatly influenced by Cognitive Grammar with which it shares fundamental assumptions (cf. Ziem & Lasch 2013). First, it assumes that language is not an autonomous cognitive instance but depends on general cognitive principles. Second, structures are results of conceptualization and schematization processes in humans. Third, linguistic knowledge results from language use. Following these main assumptions, Cognitive Construction Grammar claims to rely on psychological and cognitive processes. In constructing sentences, humans use general cognitive abilities, rather than drawing from a language-specific source that is innate in human biology. Instead, language derives from more general abilities humans need in other areas of their everyday life.

Construction Grammar is no uniform theory but instead consists of several theories within the same framework, each developed to meet specific needs. One way to group the different accounts is to distinguish between formal oriented and non-formal oriented theories. Non-formal oriented, usage-based accounts focus on the psychological plausibility and cognitive motivation for constructions (e.g., Cognitive Construction Grammar, Lakoff 1987, Goldberg 1995, 2003; Cognitive Grammar, Langacker 1982, 1987; Radical Construction Grammar, Croft 2001). Many other theories are much more formal oriented and unification-based, which makes them interesting for artificial intelligence research and robotics (e.g., Berkeley Construction Grammar, Kay & Fillmore 1999; Sign-Based Construction Grammar, Boas & Sag 2012; Embodied Construction Grammar, Bergen & Chang 2005; Fluid Construction Grammar, Steels & de Beule 2006).

There are several assumptions in Construction Grammar that are fundamentally different from Chomskyian Generativism (see Goldberg 1995, 2013; Fischer & Stefanowitsch 2006; Ziem & Lasch 2013):

a) Linguistic expressions are form-function pairings; each form has a specific function
b) There is no distinction between lexicon and grammar
c) There is no distinction between "core syntax" and the periphery
d) There is no transformation or derivation

e) There is no distinction between "competence" and "performance" (no ideal speaker)
f) There is no inborn linguistic knowledge

Even though Generative Grammar and Construction Grammar appear to be diametrically opposed, they do not necessarily contradict each other. Tracy (2011) suggests that generative and construction-based accounts complement each other. Tracy (2011) argues that children indeed acquire constructions, but in the course of their linguistic development, they de- and reconstruct these constructions and achieve a state in which several constructions converge to an abstract scheme. Thus, children to not simply memorize contructions, but they actively infer constructions from their input in a constant process of reanalyzing their conclusions concerning linguistic patterns. However, in de- and reconstructing constructions, learners are guided by specific cues, e.g., they learn the principle of compositionality of structures and binary structure building principles. Tracy (1987, 1989) argues that this seems to be the case for acquiring the left sentence bracket. A similar perspective emerges in linguistic theories that do not primarily focus on language acquisition (e.g., Jacobs 2008, Jackendoff 1997, 2002) and it is striking that data drawn from language acquisition further supports the claim that Generative Grammar and Construction Grammar do not necessarily exclude each other.

However, one cannot overlook that there is at least one major fundamental difference concerning language architecture. The assumptions a) – f) above imply that the language architecture in Construction Grammar is not syntax-centered as opposed to Generative Grammar. In the next section, I provide the fundamental assumptions of the Tripartite Parallel Architecture (Jackendoff 1997, 2002), a construction-oriented account that breaks with the syntactocentric tradition of Generative Grammar.

5.2.1.2 The Tripartite Parallel Architecture approach

The Tripartite Parallel Architecture (TPA) is sometimes considered to be sandwiched between Construction Grammar and Generative Grammar because it shares assumptions with both frameworks. Jackendoff (2002: 128) states that the program of Generative Grammar is "compelling" but that the "syntactocentric" view on language was "an important mistake". Therefore, he departs from some fundamental assumptions in Generative Grammar. One of them is that syntax is seen as the sole generative and fundamental component of language.

Jackendoff (2013b: 578) notes that TPA "preserves all the mentalistic and biological aspects of mainstream Generative Grammar" while at the same time he lists three major differences between mainstream Generative Grammar (MGG) and TPA:

- MGG is syntactocentric
- MGG is derivation-based
- MGG maintains a strict formal distinction between the lexicon and rules of grammar

These points indicate that TPA has much more in common with Cognitive Construction Grammar than with MGG. In contrast to Generative Grammar, he proposes two other generative systems that are at work in addition to the syntactic system.

5.2.1.2.1 Generative systems

According to Jackendoff (1997, 2002), phonology, syntax, and semantics are three independent generative components in the language architecture. Thus, syntax is not the main component behind a linguistic structure that receives its semantic and phonological interpretations via interfaces. Instead, all components are linked with each other through interfaces. Figure 26 illustrates the three components and their interfaces.

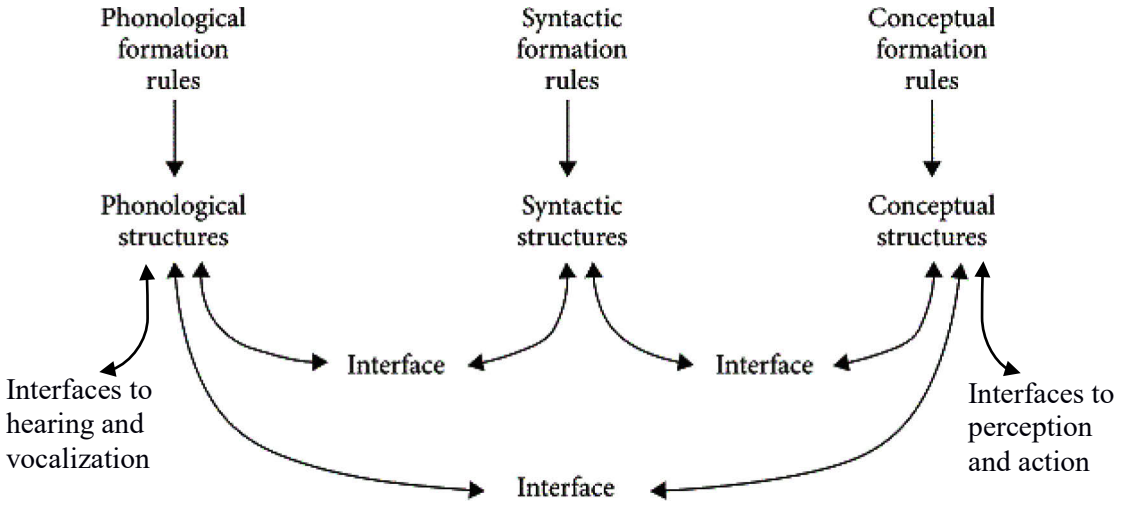


Figure 26: Components and interfaces in the Tripartite Parallel Architecture (Jackendoff 2002: 125, 2013a: 72).

The interfaces enable the linguistic system to interact with other cognitive domains, such as vision (Jackendoff & Audring 2018). In this sense, interfaces do not exclusively exist between the generative components of language but linguistic information is in constant exchange with other cognitive information. Each component includes different tiers. The syntactic component consists of a *constituent structure* tier and a *functional structure* tier, while the conceptual component includes the *descriptive* tier and the *referential* tier. Conceptual structure is more related to thought than to language. It is the domain where reasoning and planning take place, it interprets linguistic utterance in contexts, and it incorporates pragmatic knowledge and world knowledge (cf. Jackendoff 2002: 123). Formally, these different types of information can be expressed by different tiers like the *propositional* tier, the *information structure* tier, the *referential* tier, the *action* tier, or the *macrorole* tier. Information structure is thus integrated

into conceptual structure and it is not expressed by syntactic features and not represented in syntactic structures. Instead, it is placed on a tier that is related to the conceptual structure (Jackendoff 2002: 408 – 417). The role of information structure in Construction Grammar has been extensively studied by Lambrecht (1994), who defines information structures as follows:

> That component of sentence grammar in which propositions as conceptual representations of states of affairs are paired with lexicogrammatical structures in accordance with the mental states of interlocutors who use and interpret these structures as units of information in given discourse contexts.
>
> Lambrecht (1994: 5)

Similar to Jackendoff (1997), Lambrecht (1994) assumes that IS is part of the language system, existing side-by-side with semantics and syntax, referring to others like Fillmore (1976) with his tripartite of syntax, semantics, and pragmatics. Leino (2013: 4) states that IS is the "missing link" between grammar and use and Goldberg (1995) assumes information structure to be an integral component of constructions that is of the same value as other linguistic information.

Syntax in TPA is unique in the sense that syntactic structure needs to be rich enough to ensure the mapping between semantics and phonology (Jackendoff 2013a: 72). In this sense, syntax is the linguistic domain that maps sound and meaning, and it is not the central part of the language architecture. However, it is more isolated than the other two domains in that it has no interfaces with other cognitive capacities (Jackendoff 2002: 126). Wiese (2003) argues that syntax functions as the bridge between semantics and phonology and correlates hierarchical structures of the conceptual structure with the linear character of utterances. The view on syntax in TPA is fundamentally different from MGG in that it does not assume derivation to participate in constructing sentences but rather constraints. Syntactic structures are built by "clipping together" treelets at nodes that different treelets share. This process can start from the bottom up or the top down, or even in the middle of a structure. Syntactic structures are well-formed when each part of the tree corresponds to one treelet. In this way, there is no "algorithmic generative engine for producing trees"; instead, the production of trees is constraint-based (Jackendoff 2013b: 581). Jackendoff (2013b: 581) highlights that there are generative theories that assume constraints and allow for the violation and competition within these constraints, e.g., OT. Jackendoff (2013b: 584) also claims that the rather complex syntax in MGG is not compatible with psycho- and neurolinguistics findings and thus supports the *Simpler Syntax* account (cf. Culicover & Jackendoff 2005).

Even though linguistic utterances usually include semantic, syntactic, and phonological information, not all of these domains need to be represented. For example, *hello*, *wow*, and *yes*

have no syntactic representation, but full semantics and phonetics. *It*, *do,* and negations have phonological and syntactic representation, but no semantic features and nonsense phrases such as *doodah doodah* that can be found in songs, have a phonological but not semantic or syntactic representation. The same logic applies to phrase structure rules, which are lexical items that only have syntactic features but lack semantic and phonological representations. For German, the focus marker *so* has been reported to be defective in that is does not have semantic content, which affects sentence processing (cf. Schumann 2018). The effect of defective triplets on sentence processing has also been reported for light verb constructions (Wittenberg et al. 2014a). In sum, according to TPA, a well-formed sentence "is a triplet consisting of well-formed phonological, syntactic, and semantic structures, plus links between corresponding constituents of the three, established by the interface components" (Jackendoff 2013b: 72).

5.2.1.2.2 Lexicon and grammar

In accordance with other construction-based accounts, there is no distinction between words and grammatical rules in TPA. Words and rules are triplets of syntactic, semantic, and phonological information, the three separate generative components. The components are formally linked by subscripts, which mark the interface links. Interface links allow for an explicit association of the three components in long-term memory (Jackendoff & Audring 2018). The words *cat* and *the* are represented as in (101):

(101) a. $Kæt_1$ — N_1 — CAT_1
b. $ðə_2$ — Det_2 — DEF_2 (Jackendoff 2013b: 582)

The structures illustrate the three components PHON — SYN — SEM. The same formalization can be applied to phrase structures:

(102) $[ðə]_2\,[Kæt]_1$ NP $[CAT_1; DEF_2]$

Det_2 N_1 (Jackendoff 2013b: 582)

In contrast to other generative approaches like Minimalism (Chomsky 1995), phrases are not the base for phonological or semantic interpretation. Instead, structures are built in all of the components in the language architecture. Furthermore, traditional concepts like subcategorization and selectional restrictions can be integrated into these components in TPA, as opposed to Goldbergian Construction Grammar. Verbs can require arguments on the syntactic layer and thematic roles on the semantic layer. The verb *devour* can thus be formalized as in (103):

(103) PHON: /dəvawr$_{11}$ …$_{y}$ /$_{z}$
SYN: [$_{VP}$ V$_{11}$ NP$_{y}$]$_{z}$
SEM: [DEVOUR$_{11}$ (Agent: X, Patient: Y$_{y}$)]$_{z}$ (Jackendoff & Audring 2018: 9)

The SYN layer reflects a constraint-based format, rather than phrase structure rules. It indicates that in order to form a VP a V and an NP that are sisters need to be linearized in a way that V precedes NP. The interpretation of V is then applied to the interpretation of NP. The NP satisfies the subcategorization requirements of V.[27] In other words, (103) indicates that the verb requires an NP to be well-formed and that both V and NP form as VP with a specific meaning, formally expressed by superscripted *z*. The formula can be applied to smaller structures such as plural markers, and larger structures such as sentences and grammatical rules can be regarded as lexical items. These expressions are stored in long-term memory as a triplet of phonological, syntactic, and semantic information. The semantics of an idiom is stored alone, i.e., the individual components do not determine the meaning of the whole expression. One such example is the idiom *to kick the bucket*. In TPA, the formal representation would look like (104):

(104) PHON:[kɪk]$_{1}$[ðə]$_{2}$ [bʌkɪt]$_{3}$
SYN: [$_{VP}$ V$_{1}$ [$_{NP}$ Det$_{2}$ N$_{3}$]]$_{4}$
SEM: [DIE([ThingX])]$_{4}$ (Jackendoff 2013a: 74)

Subscript 4 indicates that the meaning of the whole expression is linked to the whole VP rather than the individual elements. Linguistic expressions can be either stored as a whole or they are constructed online. Jackendoff (2002: 153) argues that even very long utterances can be stored, but they do not have to be. Song lyrics, e.g., are stored rather than constructed. Fully productive constructions are built rapidly online, as is the case for the phrase structure of the VP in English. Other fully productive items are idioms, high-frequency instances of fully productive schemas, or plurals that lack plural marking. Semi-productive constructions are also regular constructions but instances of those constructions need to be "learned and stored individually" (Jackendoff 2013a: 84). Examples are denominal verbs such as *to butter the bread* or *to weed the garden* in English.

Jackendoff (2002: 179–180) assumes that structures convey meaning. However, he states that not all structures are meaningful but that the "relation between form and meaning is often more flexible". Jackendoff (2002: 180) refers to ditransitive and transitive constructions in order to argue that there is too much variation in meaning to allocate a specific meaning to a

[27] For a more detailed description of the process see Culicover (2013).

(di-)transitive construction. Instead, the verb or noun head contributes to the meaning. On the other hand, Goldberg (1995) states that (di-)transitive constructions have meanings on their own, even though verbs play an essential role in the meanings of constructions. Furthermore, Jackendoff (2002: 180) suggests that constructions combine to tree structures by "clipping together". Thus, if one regards the phrase *Send a letter to Jim* as a ditransitive construction, the construction exists of clipped together smaller constructions, in this case, VP, NP, and PP. The only grammatical rule would then be the UNIFY PIECES (in the sense of Unification, cf. Shieber 1986), and therefore no invisible operations such as movement or adjunction exist. The lexicon is regarded as a continuum with words (with full syntactic, semantic, and phonological content) at one end and phrase-structure rules (with syntactic but no semantic and phonological content) at the other.

Along the lines of other construction-based grammars, TPA assumes that the lexicon is taxonomically structured. This means that constructions are not stored unsystematically, but they cluster into hierarchically ordered families. Inheritance links allow for words to inherit triplet information or parts of it. For example, irregular verbs like *went* inherit semantic information from *go* and past, but the syntax-phonology links are overridden. Jackendoff (2002: 184) states that "the more an item inherits from other stored items, the simpler it is to store." TPA assumes that schemas are the basis of structures. According to Jackendoff & Audring (2018: 13), schemas have two roles: the generative role and the relational role. The generative role builds structures via UNIFY PIECES. It unifies the variables in the schema with other material like words or structures. The relational role is to generalize over items that are stored in the lexicon. For syntax, this assumption explains that a transitive construction can *generate* individual instances like "kick the ball", but also *relates* instances such as "kick the bucket" to meanings.

5.2.2 A construction-based analysis of V3

Equipped with the fundamental principles of Cognitive Construction Grammar and TPA, we now turn to the empirically-based analysis of V3. First, I discuss the status of V3 as a construction in the mental lexicon (sections 5.2.2.1 – 5.2.2.4); second, I present a model of construction parsing provided by Jurafsky (1992, 1996) and adapt it to V3 sentences (section 5.2.2.5).

5.2.2.1 V3 as a construction

According to Lakoff (1987: 467), a construction is defined as follows:

> **(1) Definition Construction (Lakoff 1987)**
> Each construction will be a form-meaning pair (F,M), where F is a set of conditions on syntactic and phonological form and M is a set of conditions on meaning and use.

Furthermore, Lakoff (1987: 465) argues that "grammatical constructions, in general, are holistic, that is, that the meaning of the whole construction is motivated by the meaning of the parts, but is not computable from them". A similar definition is provided by Goldberg (1995: 4):

> **(2) Definition Construction (Goldberg 1995)**
> A distinct construction is defined to exist if one or more of its properties are not strictly predictable from knowledge of other constructions existing in the grammar: C is a construction iff_{def} C is a form-meaning pair <Fi, Si> such that some aspect of Fi or some aspect of Si is not strictly predictable from C's component parts or from other previously established constructions.

Both definitions highlight that constructions must not be predictable from its parts or other constructions; hence the form of the construction is involved in the meaning of the construction. Later, Goldberg (2006: 5) weakens this criterion:

> **(3) Modified definition Construction (Goldberg 2006)**
> [Constructions are] conventionalized pairings of form and function. […] All levels of grammatical analysis involve constructions: learned pairings of form with semantic or discourse function, including morphemes or words, idioms, partially lexically filled and fully general phrasal patterns […] Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency.

According to this definition, patterns can be constructions even if their meaning is predictable from their parts, but only if they occur in the language with "sufficient frequency". However, it remains an open question when the frequency is "sufficient". In addition, constructions are "conventionalized". The term emphasizes that language is a social phenomenon.

The definitions mentioned above highlight a "form-function" pairing. Let us examine what that means within the framework. According to Ziem & Lasch (2013), "form-function" pairing usually implies syntax, morphology, and phonology on the form side and pragmatics on the function side. Others see semantic and discourse-functional properties as areas that constitute the function side of a construction. Figure 27 below illustrates the symbolic structure of a construction.

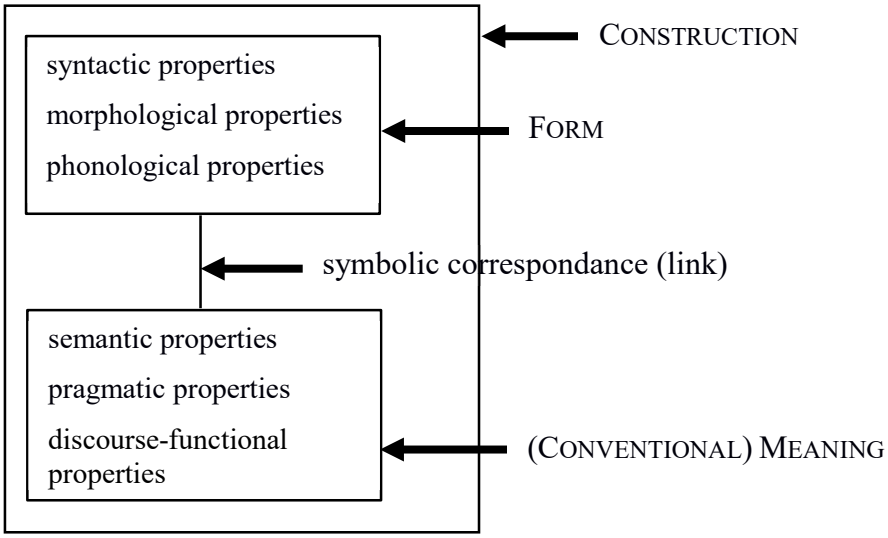


Figure 27: Symbolic structure of a construction according to Croft & Cruse (2004: 258).

Goldberg (2003) states that constructions encode generalizations about semantics, information structure, discourse structure, and information about the use of the construction in specific contexts, e.g., in registers or dialectal variation. Hence, information concerning these areas is part of the construction itself. An example for a construction is given in (105):

(105) Pat sneezed the napkin off the table. (Goldberg 1995: 3)

The verb *sneezed* usually is considered to be intransitive; however, in (105), it is in transitive use. The meaning of (105) can thus not be predicted from its components. The sentence in (105) also illustrates how structures can carry meaning. According to Goldberg (1995), it is rather uneconomic that a verb encodes the information to be transitive in some instances while it is prototypically intransitive. It is much more likely that the structure itself carries this transitive meaning. Goldberg (1995: 3) calls this construction CAUSED-MOTION-construction. The abstract meaning of this construction is 'X causes Y to move Z'. However, constructions are not restricted to the phrasal level. Goldberg (2006: 5) provides an overview of possible constructions:

Morpheme	e.g. *pre-*, *-ing*
Word	e.g. *avocado, anaconda, and*
Complex word	e.g. *daredevil, shoo-in*
Complex word (partially filled)	e.g. [N-s] (for regular plurals)
Idiom (filled)	e.g. *going great guns, give the Devil his due*
Idiom (partially filled)	e.g. *jog* <someone's> *memory, send* <someone>*to the cleaners*
Covariational Conditional	The Xer the Yer (e.g., *the more you think about it, the less you understand*)

Ditransitive (double object)	Subj V Obj_1 Obj_2 (e.g., *he gave her fish taco; he baked her a muffin*)
Passive	Subj aux VPpp (PP_{by}) (e.g., *the armadillo was hit by a car*)

Table 45: Examples of constructions, according to Goldberg (2006: 5).

The fact that abstract structures, similar to lexical items, carry meaning simply due to their form nullifies the division between lexicon and grammar. Constructions are stored in the mental lexicon just as lexical items, each with a form that corresponds to a specific meaning. Constructions can combine as long as they are not in conflict with each other (cf. Goldberg 2003: 221). In fact, Goldberg (2003: 221) states that a construction "normally involves the combination of at least half a dozen different constructions", which she illustrates with the example (106) below.

(106) [What did Liza buy the child?]

1. Liza, buy, the, child, what, did constructions (i.e., words)
2. Ditransitive construction
3. Question construction
4. Subject–Auxiliary inversion construction
5. VP construction
6. NP construction

This kind of combination gives Construction Grammar a generative touch, i.e., it is generative in the sense that it explains why an indefinite number of expressions can be produced with a limited set of components. One could argue that if one sentence consists of so many constructions, the lexicon must store several thousand or more constructions, which may be rather uneconomic. Besides, accessing a specific construction would be very time and resource consuming. Both objections assume that constructions are stored randomly and individually. Construction Grammar, however, states that constructions are organized in the mental lexicon in a specific way, namely in taxonomically organized construction networks. Before we discuss this aspect with respect to V3, let us first turn to a more basic question: Is Adv-S-V_{fin} a construction in its own right, or is it the result of multiple constructions at work at the same time?

Hilpert (2014: 14 – 23) suggests that answering the following questions can provide clues for the status of an expression:

1. Does the expression deviate from canonical patterns?
2. Does the expression carry non-compositional meaning?
3. Does the expression have idiosyncratic constraints?
4. Does the expression have collocational preferences?

The questions are ranked, depending on the quality of the answers, so that an answer to question 1. can provide stronger evidence in a specific case while an answer to question 2. may provide stronger evidence in another case. Hilpert (2014) states that even if questions 1. – 3. do not argue for a construction, a positive reply to 4. can overpower them. Still, Hilpert (2014) provides a valuable starting point in determining the status of a pattern, even though Hilpert (2014) states that identifying a construction relies on the experience of the researcher. Therefore, I consider Hilpert's (2014) suggestions as sufficient, however not necessary diagnostic criteria and add aspects of Goldberg's (2006) definition to pinpoint the status V3 sentences as a construction.

Let us first turn to Hilpert's questions one by one. V3 deviates from the "canonical" V2, assuming that declaratives are prototypically V2. Hence, 1. speaks for a construction. Question 2 requires a more complex answer: Frame-setting V3 sentences do not carry any non-compositional meaning. If so, then this is due to other constructions that co-occur with V3. The fact that the initial adverbial is followed by a subject, which in turn is followed by a verb, does not convey any non-compositional meaning. Each element of the sentence is interpreted in its usual meaning, and V3 does not evoke additional semantics. In V3, the information of a V2 clause is only distributed differently in order to exploit the potential of the prefield to host frame-setters and topics; but both elements can also occur in V2 sentences without a difference in meaning between V2 and V3. However, the situation is different for discourse-linking V3. Here, V3 indeed signals that the initial element is a discourse structuring component, which is not necessarily present in the V2 counterparts. *Dann* in V3, for example, is semantically bleached and instead takes on a discourse structuring function. Thus, frame-setting V3 has no non-compositional meaning, which speaks against the construction status, while discourse-linking V3 has a non-compositional meaning, which speaks for the construction status. Structures in which the adverbial still has its original meaning, but still function as discourse markers, could be seen as evidence that the discourse-linking V3 construction is currently undergoing entrenchment in the constructicon (the equivalent to the lexicon in the construction grammar framework).

But is that reason enough for discourse-linking V3 to count as a construction in its own right? Or is it instead an instantiation of a superordinate discourse marker construction? Answering these questions leads to question 3. ('Does the expression have idiosyncratic constraints?'). Discourse markers precede V2 sentences without any restriction in the serialization of the following elements. As opposed to V3, discourse markers can precede objects:

(107) Also den Hund würde ich nicht mitnehmen.

To the best of my knowledge, there is no study claiming that the preverbal area in these sentences is restricted to specific elements. In V3 (both frame-setting and discourse linking) the type of elements in the preverbal area is restricted. The adverbial must be followed by a topical subject. This is supported by the findings of the acceptability judgment task and the self-paced reading study, which showed that Adv-O-V_{fin} is not a preferred structure. Hence, the answer to 3. argues for a construction.

V3 does not seem to appear with collocational preferences (question 4). However, the data suggest that objects tend to follow the verb directly. The corpus study in section 2.7, however, does not allow for a broad generalization.

Does Goldberg's (2006) definition argue for a Adv-S-V_{fin} construction? The definition entails three major characteristics a construction is supposed to display:

1. [Constructions are] conventionalized pairings of form and function.
2. Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist
3. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency.

1. and 2. roughly coincide with Hilpert's questions 1., 2., and 3. But the definition entails that structures that are predictable from its component parts are potentially constructions if they occur with "sufficient frequency". Even though "sufficient" calls for further operationalization, the literature has shown that V3 does not frequently occur. Let us examine the role of frequency for constructions in more depth to evaluate implications for the status of V3.

5.2.2.2 Entrenchment, frequency, and linguistic creativity

Frequency plays a crucial role in the acquisition of constructions and is strongly related to the entrenchment of a construction, i.e., the degree to which a pattern has the status of a construction and is accessed and used productively. The frequency of patterns in a speech community correlates with the degree of cognitive entrenchment of the patterns in the same speech community. There are two types of entrenchment: type entrenchment and token entrenchment. Type entrenchment means that there are many tokens for one type of construction, i.e., there are many transitive constructions in which different verbs occur. The frequent occurrence of such constructions leads to an inference of an abstract schema and to a high degree of entrenchment.

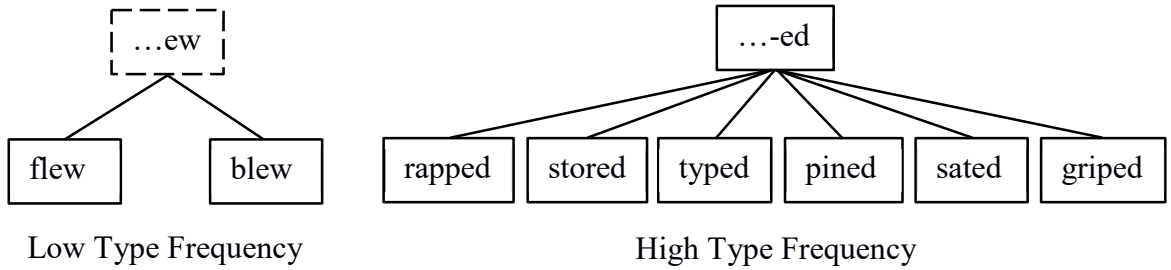


Figure 28: Type entrenchment (Croft & Cruse 2004:309).

Goldberg (2006: 99) states that speakers tend to be more productive with constructions that are high in type frequency. Some argument structure constructions appear with many different verbs, and therefore it is highly likely that speakers extend these constructions to other verbs. Hence, "a pattern is considered extendable by learners only if they have witnessed the pattern being extended" (Goldberg 2006: 99).

In token entrenchment, a token becomes a fixed unit itself, which is the case for single-word constructions or idioms. The same token occurs in high frequency so that it becomes a construction itself. This gives rise to the entrenchment of instances.

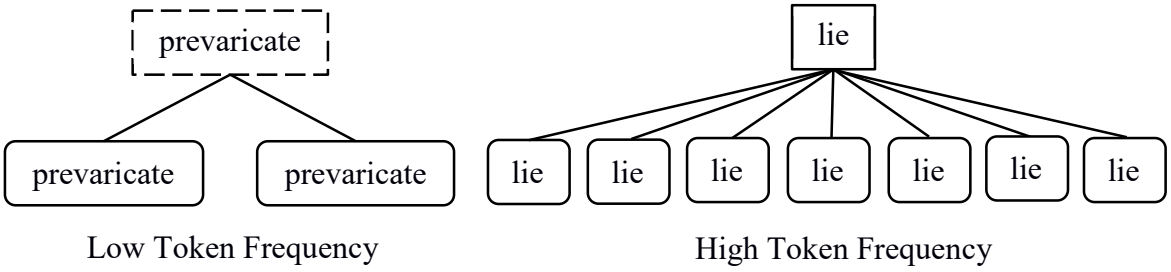


Figure 29: Token entrenchment (Croft & Cruse 2004: 309).

Croft & Cruse (2004: 310) highlight that the tokens must be similar in order to form a superordinate category. In addition, less entrenched tokens contribute more to the entrenchment of superordinate categories and more entrenched tokens. Frequency and entrenchment have been reported to be one of the factors that influence the productivity of constructions in language acquisition (cf. Goldberg 2006).

Adv-S-V_{fin} seems to be a special case of low type frequency. An abstract schema for a declarative clause is the pattern X-V-X. This pattern occurs very frequently and many different elements can fill the pre- and the postverbal slots ('X'). This leads to a high type frequency because many instances of the same type lead to a high entrenchment of the declarative schema. However, Adv-S-V_{fin} are restricted to preverbal ADVERBIAL >> SUBJECT, but the lexical realization can vary, which makes them different from idioms. Adv-S-V_{fin} is thus the result of a low type frequency, and in these constructions, the degree cognitive entrenchment is low.

However, as we have seen, the frequency of V3 is different between Kiezdeutsch and monolingual German. How can this be explained in construction grammar, and what does that mean for the status of V3 in Construction Grammar?

Kiezdeutsch speakers might be more proficient in categorizing and generalizing linguistic patterns that they encounter in their everyday life. They might extend these abilities more broadly due to their multilingual background[28]. From their everyday input, these speakers extract the functional potential of the German prefield in declarative constructions due to their frequent occurrence. In addition, they come into contact with V3 in restricted contexts in everyday German and expand the pattern due to their cognitive abilities and experience in language use. It has been argued that multilingual children indeed have cognitive advantages (see Nicoladis & Smithson 2018), which could boost such a development. Besides, due to their sensitivity regarding registers (cf. Bunk & Pohle 2019), they might infer that an V3 construction is only appropriate in a specific context (in informal in-group situations). Thus, they do not overgeneralize, and the construction is associated with these very restricted contexts. This adds a cognitive dimension to Wiese & Rehbein (2016: 57), stating that Kiezdeutsch "provides a more liberal grammatical system to support such options [=Adv-S-V_{fin} orders]". They further elaborate: "In a speech community with a high incidence of multilingualism, we can expect more openness towards new developments compared to more monolingual contexts, given that speakers are familiar with more diverse repertoires and higher degrees of linguistic variation" (also cf. Wiese, 2009, 2013). The fact that Kiezdeutsch speakers make use of a structure represented in German grammar indicates that the frequency needs to be sufficient to allow such a generalization. Thus, the higher frequency of V3 in Kiezdeutsch can be seen as an argument for V3 as a construction in informal German in general, not only Kiezdeutsch.

In sum, it seems that the data regarding the status of V3 as a construction in its own right is inconclusive. On the one hand, the structure has a fixed form with many restrictions concerning grammar, pragmatics, and occurrence in communicative contexts and there is evidence that it is entrenched as a construction, even though the degree of entrenchment appears to be low. On the other hand, all the components that contribute to its meaning can also be found in other structures, and the structure is rather infrequent. If one assumes that V3 is not a construction in

[28] Applying empirical studies exploring the psychological reality of categorization and generalization (cf. Goldberg et al. 2007 and references therin) to multilingual speakers might be fruitful and provide empirical support for this claim.

its own right, it should be possible to pinpoint the constructions that are involved in V3 sentences. Let us turn to this aspect in the next section.

5.2.2.3 V3 as the result of multiple co-occurring constructions

Two constructions in the extant literature could potentially be involved in placing constructions at the word-level (i.e., constituents in generative terms) in the initial position: the DECLARATIVE-construction and the TOPICALIZATION-Construction. According to Fillmore et al. (2012), DECLARATIVE-constructions are part of the family of the clause-defining construction. Linguistically, these constructions are realized by various other constructions, such as the SUBJECT-PREDICATE-Construction or the IMPERATIVE-Construction. While for the English language, some research focuses on the relationship between sentence types and constructions (cf. Panther & Köpcke 2008, Stefanowitsch 2003), the literature on German sentence-type-constructions is sparse (but see Finkbeiner & Meibauer 2016).

Panther & Köpcke (2008: 84) state that the sentence types are "prototypically organized categories", consisting of "morphosyntactic, semantic, and pragmatic attributes that characterize the best exemplars of the category". The authors show that declarative sentences are "the central member of the category SENTENCE", i.e., they are prototypical instantiations of the category SENTENCE containing a maximal number of properties of the category. Several reasons motivate this assumption. First, when people are asked to utter a sentence, they most often produce declaratives, and various studies in linguistic typology have shown that affirmative declaratives can be regarded as the basic sentence type. Second, other sentence types can be transformed into declaratives while this does not always work in reverse. Third, presuppositions of non-declarative sentence types are, when verbalized, declarative utterances. For example, in the sentence "Open the door" the speaker assumes that there is a door that the hearer is able to open. These facts need to be given in declaratives when they are verbalized explicitly. Panther & Köpcke (2008: 90-92) list morphosyntactic (see (108)) and semantic-pragmatic (see (109)) attributes that prototypical English declaratives entail.

(108)
i. The prototypical sentence has the word order SVX.
ii. It has a lexically realized subject.
iii. The subject is in the nominative case.
iv. The prototypical sentence contains a finite verb form that agrees with the subject in person and number.
v. The verb form is in the indicative mood.
vi. The verb is in the active voice.
vii. The intonation is falling.

(109)
i. The ideal sentence has a high degree of context-independence.
ii. It has a coded assertive illocutionary potential and additional pragmatically derived illocutionary potentials conveyed through generalized conversational implicatures;
iii. It expresses a propositional content; following Searle (1969) we [Panther & Köpcke] assume that the propositional content is analyzable into two components: a referential part and a predicative part.

In addition, Panther & Köpcke (2008: 94-95) provide a form/function scheme for assertive declaratives.

Form	**Content/Function**
word order: SVX subject: nominative case, lexical predicate: finite verb mood: indicative voice: active intonation: falling	context: independent linguistically coded illocutionary potential: assertive illocutionary potential derivable through generalized conversational implicatures: e.g., directive propositional content: no restrictions

Table 46: Form and function of assertive declaratives in English, according to Panther & Köpcke (2008: 94-95).

For German, there is no systematic analysis of the DECLARATIVE-construction to the best of my knowledge. However, many authors assume that declaratives (together with interrogatives, and imperatives) constitute a prototypical core-sentence-type from which others are derived (see, e.g., Reis 2016). They assume specific properties, including V2 placement (Finkbeiner 2018: 165, footnote 26). In addition, the features mentioned in (108) and (109) also apply to German declaratives (see Oppenrieder 2013).

A formal way to express declarative constructions in German is provided by Jacobs (2016: 37). He formalizes V2-assertives in the following way:

(110)

Phon:		/X Y Z/
Syn:		$[X_{\text{-w}}\ [Y_{\text{Fin}}\ Z_{\text{FinP,}\cancel{X}\text{,}\cancel{Y}}]]_{\text{-sub}}$
Sem:	prop:	$(X_{\text{-w}}\ [Y_{\text{Fin}}\ Z_{\text{FinP,}\cancel{X}\text{,}\cancel{Y}}]])^{\text{prop}}$
	ill-typ:	ASSERT(prop)

The formula resembles the formalization in TPA and encodes the following information: The sentence can be uttered as an independent clause on its own (indicated by [-sub]), it does not have an initial [W]-Element, and it includes a FinP. Note that Jacobs (2016) develops a model in which structures that can be explained without assuming a construction go back to projections. It follows that Syn in (110) includes a COMPLEMENT-Construction, which allows

for subject-verb agreement.[29] Because German assertive declaratives sentences fulfill the criteria in (108) and (109), declarative sentences prototypically exhibit V2 with an initial subject.

V2-constructions either include a SUBJECT-PREDICATE-Construction or a COMPLEMENT-construction that realizes subject-verb orders and subject-verb-congruency. As indicated above, one could argue that these structures combine with other constructions, which cause other elements to appear in the initial position. One of those constructions is the TOPICALIZATION-construction, which leads to O-V2 sentences. Deviations from V2 in declaratives have not yet been discussed extensively in Construction Grammar and Stefanowitsch (2011) highlights that even though word order phenomena are discussed in Construction Grammar, there is no systematic approach to word order variation. Goldberg (1995: 229, footnote 4) states that word order is "inherited from other more general constructions in a language", and hence it is not part of a particular construction. However, specific word orders are achieved by applying specific constructions "further down in the inheritance hierarchy" (Goldberg 1995: 110), such as the TOPICALIZATION-construction and SUBJECT-PREDICATE-construction. The SUBJECT-PREDICATE-Construction specifies a word order constraint for English (cf. Goldberg 1995: 110). Thus, ordering constructions are superordinate to other constructions. Jacobs (2008) observes that topicalization is allowed only for specific sentence types, especially sentence types with the illocution-attribute [assertion]. Topicalization does not occur in questions, and the usage of topicalizations in subordinate clauses is very limited. Besides, topicalization in German is connected with a specific accent, namely a rising accent and a falling accent. The first accent is interpreted as contrastive:

(111) /ALle Politiker sind \SELten einer Meinung. (Jacobs 2008: 65)

Topicalizations are restricted to specific sentence types because they indicate conventionalized attitudes of the speaker. Jacobs (2008: 66) describes this attitude as follows: Rising intonation on the first element X signals that the speaker wants to give some kind of information on the following expression Y. This information a) refers to X and b) refers to at least one other alternative competing with X. Speaker attitudes are also expressed with other means in German, e.g., with modal particles. Like topicalizations, modal particles are restricted

[29] For German there are several suggestions for a combination of constructional and projectional grammars (e.g., Jacobs 2008, 2016, Welke 2016). Welke (2019) even states that the relation between projectional and constructional accounts is not an either-or, nor do they have to exist side-by-side. Rather, there has to be an interaction between both accounts. Note that Jacobs (2008) considers categorial grammar, LFG, HPSG, lexical decomposition grammar, modular valence grammar and generative minimalism to be projectional grammars.

to sentence types. From a semantic point of view, if Y gives information concerning X, then the propositional content of Y must have the type <s,t>. Hence, it must be a proposition. Questions, however, are of the type <<s,t>,t>, which constitutes a propositional set. For that reason, topicalizations cannot occur in questions. According to Jacobs (2008), topicalizations have syntactic, prosodic, and semantic features that are not inferable from their components; this is an argument to treat topicalizations as constructions. In German, topicalization co-occurs with subject-inversion, i.e., the subject appears in the postverbal position. I assume that inversion is an integral component of the TOPICALIZATION-construction: It not only places an object in the initial position but rearranges the subject and object. TOPICALIZATION also applies to initial adverbials because they also evoke subject-inversion.

What does that mean for V3 sentences? V3 sentences represent prototypical declaratives, apart from the fact that they have two preverbal components, one of them being the preverbal subject with its default topic function. If TOPICALIZATION participates in placing the adverbial first, inversion should take place. As has been illustrated earlier, the data provide evidence against topicalization of the preverbal constituents. There is no prosodic indication for a topicalization. Furthermore, the initial adverbial is preferably temporal or local, and thus a typical frame-setting adverbial. For V2 sentences with frame-setting adverbials, one could think of a FRAME-construction that lacks prosodic features of topicalizations but prototypically has an initial temporal or local adverbial. Such a construction would place frame-setters preverbally with the verb in the second position. Hence, it could be treated as a sub-construction of DECLARATIVE that is linked to TOPICALIZATION sharing the properties of rearranging constituents. However, neither TOPICALIZATION nor FRAME can explain V3. Therefore, I assume that V3 is not the result of multiple constructions but constitutes a construction in its own right. Moreover, it seems that V3 shares properties with the FRAME-construction but not with the TOPICALIZATION-construction. In the following section, I discuss the status of V3 in the constructicon, considering the arguments put forward in the previous sections.

5.2.2.4 V3 in the constructicon

Constructions are organized via taxonomic relations in the constructicon. The relationships between constructions are vertical, i.e., links between more abstract constructions and less abstract constructions, and horizontally, i.e., links between constructions at the same level. Thus, every human has a structured inventory of different constructions, which form a network of associations between constructions (cf. Goldberg 1995: 5). Goldberg (1995: 74 – 81) argues

for a number of link types between constructions: instance links, polysemy links, subpart links, and metaphorical extension links. Instance links are links between constructions where one construction is a special case of another construction, i.e., one construction is a more specified version of the other. For instance, lexical items that occur only in a specific construction inherit the semantics and syntax of another construction. Goldberg (1995: 79) uses the word *drive* as an example. *Drive,* in a specific sense, only occurs in a resultative construction. Example (112) is a special case of the resultative construction and thus they are linked via an instance link:

(112) a. Chris drove Pat mad/bonkers/bananas/crazy/over the edge,
b. *Chris drove Pat silly/dead/angry/happy/sick. (Goldberg 1995: 79)

Polysemy links extend the central meaning of a construction to other constructions. In (113), for example, the central sense of the DITRANSITIVE-construction is 'X causes Y to receive Z' which is extended in (113):

(113) a. 'X causes Y to receive Z ' (central sense)
Joe gave Sally the ball.
b. 'X enables Y to receive Z'
Joe permitted Chris an apple. (Goldberg 1995: 75)

Subpart links are links between a construction A and another construction B, where A is a proper subpart of B. This means that B entails the semantic and syntactic specifications of A in addition to other specifications. The CAUSED-MOTION-construction in (113) above entails the properties of an INTRANSITIVE-construction. Still, both constructions exist independent from each other (as opposed to constructions that are linked via instance links).

Metaphorical extension links are established when the semantics of a construction is mapped to another construction's semantics by a metaphor. For instance, the meaning of a dominating CAUSED-MOTION-construction in (113) can be metaphorically extended to a dominated RESULTATIVE-construction in (114). While (114) expresses a concrete goal of the action, in (114), this goal is expressed in a metaphorical sense, which changes the status of the metal from not-flat to flat.

(114) a. Pat threw the metal off the table.
b. Pat hammered the metal flat.

Hilpert (2014) highlights that polysemy links, instance links, and metaphorical extension links relate to higher and lower levels of abstraction, while subpart links connect constructions at the same level of abstraction. But what exactly are levels of abstraction in Construction Grammar?

Constructions differ in the degree of abstractness, which is why they are organized on a continuum with the two poles *maximal abstract* and *minimal abstract*. Both form and meaning feed into abstractness, i.e., a construction can be maximal in form but minimal in meaning (e.g., a DITRANSITIVE-CONSTRUCTION) or minimal in form but maximal in meaning (e.g., free lexical items). More abstract constructions are on the top levels in a hierarchically structured tree of constructions, and less abstract constructions are at the bottom.

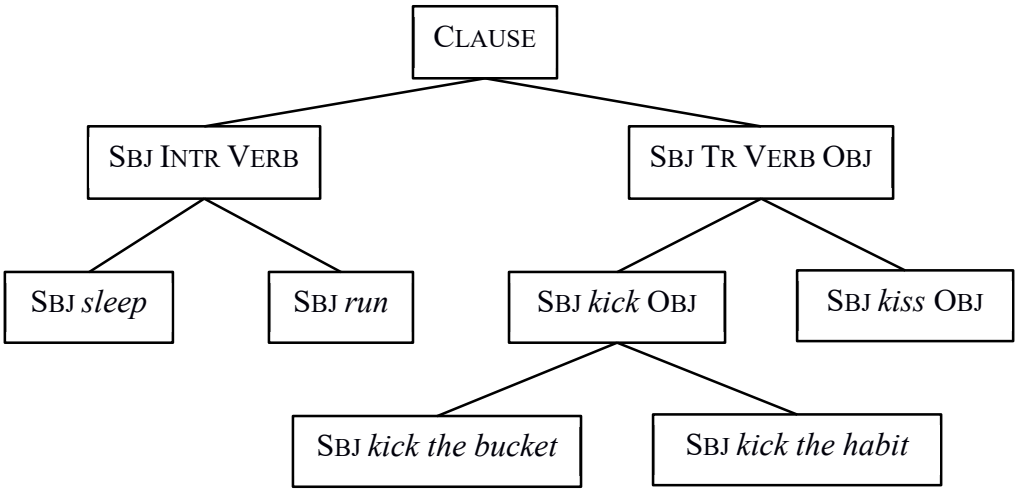


Figure 30: Partial construction network (Croft & Cruse 2004: 264).

Each node represents a unique construction with "idiosyncratic morphological, syntactic, lexical, semantic, pragmatic or discourse-functional properties" (Croft & Cruse 2004: 263); thus, a structure that cannot be predicted by other constructions or the components in the structure itself. The constructions at the bottom level in Figure 30 all include the verb *kick*, yet the individual constructions have different meanings that cannot be predicted by their subparts of the other constructions, neither on the same level nor on an upper level in the tree. However, the tree structure is inheritance-hierarchical in the sense that the lower node inherits construction-specific characteristics from the upper nodes. In the example above, *Sbj kick the habit* and *Sbj kick the bucket* inherit the transitive structure of the verb of the construction *Sbj kick Obj*, but also properties concerning verb inflection, phonological realization, and specific information regarding the subject (cf. Boas 2013: 244). This mechanism allows for broad generalizations over individual instances and constructions, leading to more abstract schemas. Hence, the hierarchy results from categorizing the input, an ability that is not specific to language but is considered to impact language acquisition immensely.

Some constructions can be more prototypical than others. A prototype is a construction that shares the most features with other constructions on a lower level; it "comprises the maximal number of features common to the category, often 'averaged' across exemplars" (Ibbotson &

Tomasello 2009: 62). Goldberg (1995) states that forms often have prototypical meanings, namely those that reflect the immediate perception of the world, i.e., "constructions which correspond to basic sentence types encode as their central senses event types that are basic to human experience." (*Scene encoding hypothesis*, Goldberg 1995: 39). This meaning may then be transferred to other constructions, e.g., via metaphors, leading to extensions of the meaning, as illustrated in Figure 31.

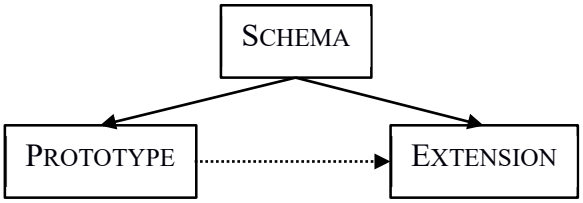


Figure 31: Network model, according to Langacker (2002: 271).

An example is the given in (115), adopted from Evans & Green (2006: 667):

(115) a. Lily gave George a kiss.
b. Lily knitted George a jumper.
c. Lily owes George a fiver.

These ditransitive constructions all share the meaning 'transfer', but they mean different kinds of transfer. (115) is a successful transfer, whereas in (115), it is not clear whether George will ever get the jumper or the money. According to Goldberg, the prototypical sense is (115), successful transfer. All instances, however, have the same schema [NP V NP NP].

Geeraerts (2006: 149) argues that the network must be very open and that there is no clear-cut distinction between constructions since constructions share features concerning their meaning with other constructions. These other constructions can have more than one meaning since several constructions with their individual meanings feed them at the same time.

That means that a construction network is dynamic, i.e., constructions and prototypes can emerge and change over time. There is no fixed set of constructions; instead, constructions result from social and cultural conventions. Langacker (2002) argues that the network can grow "'upwards' via schematization, 'outwards' via extension, and 'downwards' as more detailed instances are added" (Evans & Green 2006: 546).

Having discussed the basic assumptions concerning constructions and the structure of the constructicon, we are now able to examine the representation of V3 declaratives in Construction Grammar. Concerning the status of declaratives, Welke (2019) suggests a relation between verb placement and sentence type in constructions. He assumes that the verb is implemented in different positions in a construction that is hierarchically superordinate. These formal

differences correspond with semantic-pragmatic differences, e.g., V2 sentences are prototypically declaratives. His assumption is visualized in Figure 32.

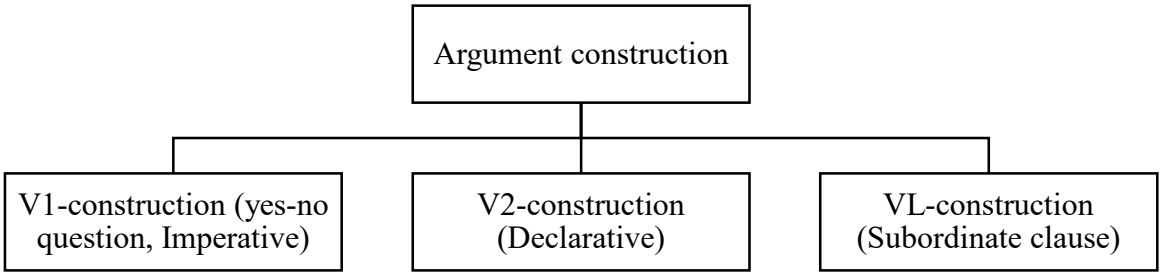


Figure 32: Verb placement and sentence types in argument-constructions, according to Welke (2019).

Welke (2019) suggests that V>3 patterns do not solve the problem of multiple preverbal constituents:

> Aber auch eine konstruktionsgrammatische Lösung des Problems der mehrfachen Vorfeldbesetzung kann nicht einfach behaupten, dass es neben dem V2-Muster marginal ein V3-Muster (und V4, V5, … Muster) gibt. Dann sollte nämlich die Verbdritt-Stellung auch oder sogar vor allem für Sätze mit Subjekt in Erst- oder Zweitposition gelten. Mehrfache Vorfeldbesetzungen mit dem Subjekt im Vorfeld sind jedoch auf bestimmte unten zu erläuternde Fälle begrenzt. Das Gros der Belege Müllers enthält Sätze, in denen 2. oder 3. Argumente und Modifikatoren mehrfach im Vorfeld vorkommen, aber nicht 1. Argumente (Subjekte) mit anderen Argumenten oder mit Modifiaktoren [sic], außer mit Satzadverbialen. (Welke 2019: 312-313)

V3 is limited to Adv-S sequences with initial frame-setting adverbials, and hence they include a subject and a modifier that is not a sentential adverbial. The structure exploits the potential of the preverbal area in that it hosts the subject in its prototypical position in a declarative with a default topic interpretation. It makes use of the fact that an initial adverbial can occur preverbally if it is a frame-setter and in this case, no inversion occurs. I refer to this construction as the FRAME-SUBJ-Construction. In a hierarchically structured network, it occurs below the DECLARATIVE-Construction and is horizontally linked to the FRAME-Construction. From DECLARATIVE it inherits specific features concerning prosodic realization, pragmatics, and morpho-grammatical preferences (cf. (108)). It does not inherit the inversion property shared by TOPICALIZATION and FRAME. Its unique function is to override word order constraints of the DECLARATIVE-Construction in order to convey a specific meaning that draws from pragmatic and information-structural properties of the German prefield. Some of the general properties of the construction are summarized in (116):

(116)

PHON/PROS:	/ (X_1 Y_2 Z_3) /
SYN:	[Adv_1 [(DP|NP[Subject])$_2$ $Vfin_3$]]]
IS:	[$_{Frame\text{-}setting}X_1$ [$_{Topic}Y_{2\ comment}Z_3$]]
PRAG:	informal/semi-informal contexts

Following other construction-based accounts (cf. Leino & Östman 2005), (116) encodes discourse-functional and pragmatic properties provided in a construction on a specific tier. This analysis does, however, not include discourse-linking V3. For these, I suggest a second construction that applies when the initial adverbial functions as a discourse linker. While it would be tempting to assume that discourse-linking V3 is the result of a discourse marker construction, this would not explain the Adv-S restriction because this restriction does not hold for other kinds of discourse markers. Both discourse-linking V3 and the FRAME-SUBJ-Construction are limited to the Adv-S sequence, and FRAME-SUBJ is a daughter of the DECLARATIVE-construction. It is nevertheless linked to the discourser marker construction, as suggested by Imo (2012). Imo (2012: 79) describes the following attributes for discourser marker constructions in German:

(117)

SYN:	pre-prefield position, can combine with other discourser markers
MORPH:	short, often emerged from fixed phrases
SEM:	bleached, does not affect the following contribution
FUNC:	framing of the utterance and organization of the discourse
SEQU:	projects an utterance, which is integrated into the context of the preceding utterance
PROS:	prosodically marked if the discourse marker has a homonymous counterpart, otherwise prosodically free

Imo (2012) highlights that discourse markers do not necessarily have to be separated prosodically. Prosody helps in disambiguating the initial element only if a lexical item has a homophonous counterpart that can also occur in the pre-prefield position. In V3, the adverbial can function as a discourse marker or a frame-setter, or it can have properties of both. Hence, separating the initial adverbial prosodically might indicate a discourse-linking function, while the prosodic integration into the following utterance might be evidence for a frame-setter. To the best of my knowledge, there is currently no designated study on the prosody of V3 and the different types of V3 based on prosody. However, as shown in section 2.3, both versions exist; V3 with and without a prosodically separate adverbial. For the sake of simplicity, let us assume that clear cases of frame-setting V3 do not display a pause between the first and second element, while clear cases of discourse-linking V3 do. In these clear yet probably very simplified and idealized cases, the prototypical discourse linker V3, which I refer to as the DM-SUBJ-Construction, has the following properties:

(118)

PHON/PROS:	/ (X_1 | Y_2 Z_3) /
SYN:	[Adv_1 [(DP|NP[Subject])$_2$ $Vfin_3$]]]
IS:	[$_{DM}X_1$ [$_{Topic}Y_{2\ comment}Z_3$]]
PRAG:	informal/semi-informal contexts

Both frame-setting V3 and discourse-linking V3 can be used in informal or semi-informal contexts, determined by the entry in the construction. They exhibit the same constituent serialization but differ in function. What needs to be investigated in detail are the prosodic differences between the two types of V3 structures. Figure 33 illustrates in a simplified manner how V3 could be represented as two constructions in the constructicon.

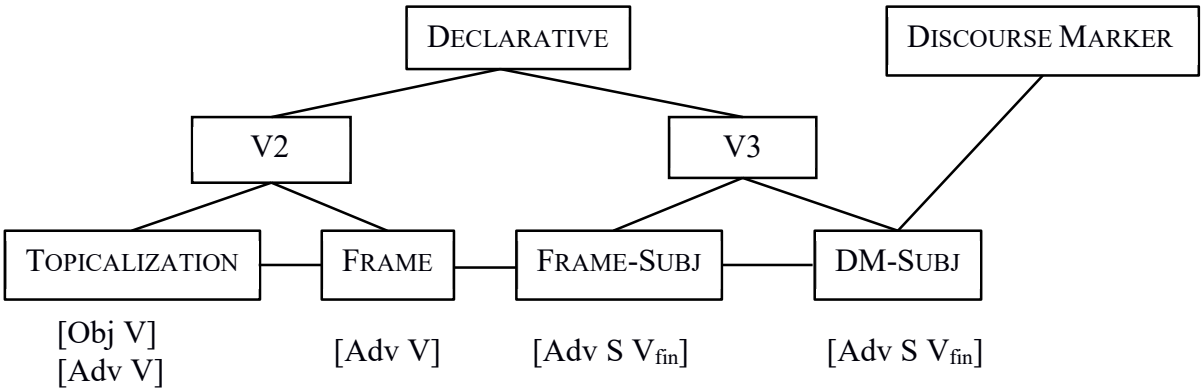


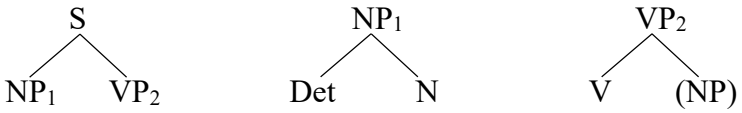
Figure 33: Adv-S-V_{fin} in a construction network (condensed).

Since the construction is dynamic and FRAME-SUBJ and DM-SUBJ are linked, nothing speaks against hybrid V3 constructions with both frame-setting and discourse linking functions to different degrees. In the next section, I define an account of how a V3 construction might be processed.

5.2.2.5 Parsing V3 as a construction

Jackendoff (2002, 2007, 2013b) describes a constraint-based and non-directional model of sentence computation. In contrast to phrase structure rules, syntactic structures in TPA are not derived by expansion of a maximal node to terminal elements (e.g., from S to N, V, Adj), but by "clipping together treelets" (Jackendoff 2013b: 581) on nodes which the treelets share. In (119) this is indicated by indexes.

(119)

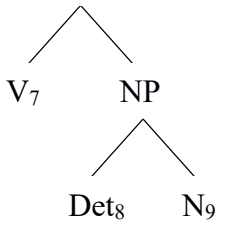


According to Jackendoff, this process is compatible with serial, parallel, top-down, and bottom-up computation. In sentence processing, this leads to a stepwise analysis of sentences in the form of tree structures that are built incrementally by treelet clipping. The parser predicts

the following elements based on grammatical information that is available to the parser at a specific point in time.

As illustrated above (see section 5.2.1.2), structures can be assigned meanings that do not derive from the individual components in that structure:

(120) kik$_7$ ðə$_8$ bukət$_9$ VP$_{10}$ [X DIE$_{10}$]



(Jackendoff 2013b: 583)

The concept of clipping together without assuming transformations is specified in Culicover & Jackendoff (2005). The authors state that the "simpler syntax"-component in TPA is much more compatible with psycho- and neurolinguistic research, especially in terms of processing and production. Simper syntax assumes that syntax mediates between phonological and semantic structure. Syntactic structures are flat, hierarchically ordered trees that consist of syntactic features. The theory rejects the "hidden levels" (Culicover & Jackendoff 2005: 16), such as movement.[30]

Sentence processing in TPA is based on the idea that when hearing a sequence of sounds, these sequences are related to semantic meaning as a result of storing complex linguistic information in short-term memory. First, all possible elements that match a specific sound profile or sequence of sounds are activated in the constructicon. In a second step, those elements are bound "in appropriate departments of working memory", including their phonological, semantic, and syntactic information. (121) illustrates this mechanism with the sound stream "[əparənt]" (Jackendoff 2007: 15):

(121) *Lexicon*

ə – Det – INDEF tuw – Num – TWO		kæt – N – CAT
tuw – P – TO	**perənt – N – PARENT**	kik ðə bukət – VP – DIE
dəvawr – V – DEVOUR	**əperənt – Adj – APPARENT**	
[$_{VP}$ V – NP]	[$_{VP}$ V – AP] [$_{NP}$ Det – N]	[A] [$_{S}$ NP – VP]

Working Memory

[ə]$_1$ [perənt]$_2$	Det$_1$ N$_2$	INDEF$_1$ PARENT$_2$
[əperənt]$_3$	Adj$_3$	APPARENT$_3$

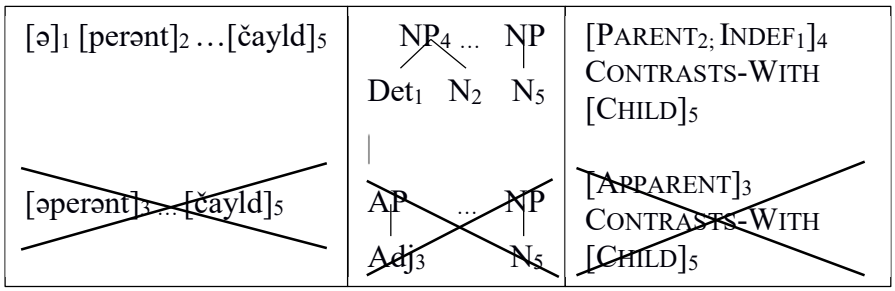
[30] Within the frame of this dissertation, the complete concept cannot be described in detail. See Culicover & Jackendoff (2005) for a comprehensive depiction of Simpler Syntax.

After specific items have been activated, syntactic integration takes place and syntactic structures in the form of trees are built. Accordingly, semantic integration builds semantic structures. Finally, there are two competing candidates for the sound stream [əparənt]. The ambiguity is solved by context, i.e., the occurrence of the lexeme "child" later in the sentence. Links between the wrong candidate and the lexicon are dissolved, and so is the activation of the wrong candidate in working memory. Only the correct candidate stays in working memory with its links to the lexicon:

(122) *Lexicon*

ə – Det – INDEF	tuw – Num – TWO	kæt – N – CAT		
tuw – P – TO	**perənt – N – PARENT**	kik ðə bukət – VP – DIE		
dəvawr – V – DEVOUR	**əperənt – Adj – APPARENT**			
[VP V – NP]	[VP V – AP]	[NP Det – N]	[A]	[S NP – VP]

Working Memory



(Jackendoff 2007: 15)

Jackendoff's model of language processing shares many similarities with Jurafsky's Construction Grammar-based model of sentence comprehension. Along the lines of Construction Grammar (or to be more precise Construction-Based Interpretative Grammar), Jurafsky (1992, 1996) assumes that language is represented uniformly, i.e., semantic, syntactic, and lexical information is represented and processed by the same interpretation mechanism. This model assumes a parallel parser that draws conclusions from probabilities. Probability is assigned to 1) the construction as a whole and 2) to its subparts that express linguistic expectations. This resembles Mitchell's et al. (1994) differentiation between fine-grained information and coarse-grained information. Jurafsky (1996) assumes that expectations apply to phrase structures and valence-bearing predicates. Probabilities, and thus expectations, are correlated with frequency in the sense that high-frequency constructions increase the probability of their occurrence. Jurafsky's model (named "Sal") consists of three components, ACCESS, INTEGRATION, and SELECTION. Their functions are summarized in Table 47.

Access Function		Access a construction whenever the evidence for it passes the access threshold.
Integration Function		An interpretation is built up for each construction as each of its constituents is processed, by integrating the partial information provided by each constituent.
Selection	**Selection Choice Principle**	Prefer the interpretation whose *most recently integrated element* was the most *coherent* with the interpretation and its lexical, syntactic, semantic, and probabilistic expectations.
	Selection Timing Principle	Prune interpretations whenever the difference between their ranking and the ranking of the most-favored interpretation is greater than the selection threshold.

Table 47: Components of the Sal, according to Jurafsky (1992: 9 – 11).

Jurafsky (1992: 64) sketches out the general algorithm for Sal:

1. Examine the input. As evidence accumulates for the applicability of constructions in the grammar, increase their activation values.
2. When a construction's activation passes the *access point*, copy it into the access buffer, or if the construction was suggested by evidence already in the access buffer, *integrate* it directly with the access buffer.
3. Integrate the access buffer with the interpretation store as follows (successful integration may increase the size of the buffers):

   For each interpretation *i* in the interpretation store
   Make a copy *c* of the interpretation *i*
   For each construction in the access buffer
   Integrate the current point (the cursor) of *c* with *a*.

   Clean up by removing any structures which failed to integrate.
4. Clear out the access buffer after integration.
5. Update the selection rankings of each interpretation in the interpretation store
6. If any interpretations in the interpretation store are worse than the best interpretation, by at least the selection threshold σ, prune them from the interpretation store. If only one interpretation remains in the selection store, it is *selected*.

The mechanism is visualized in Figure 34.

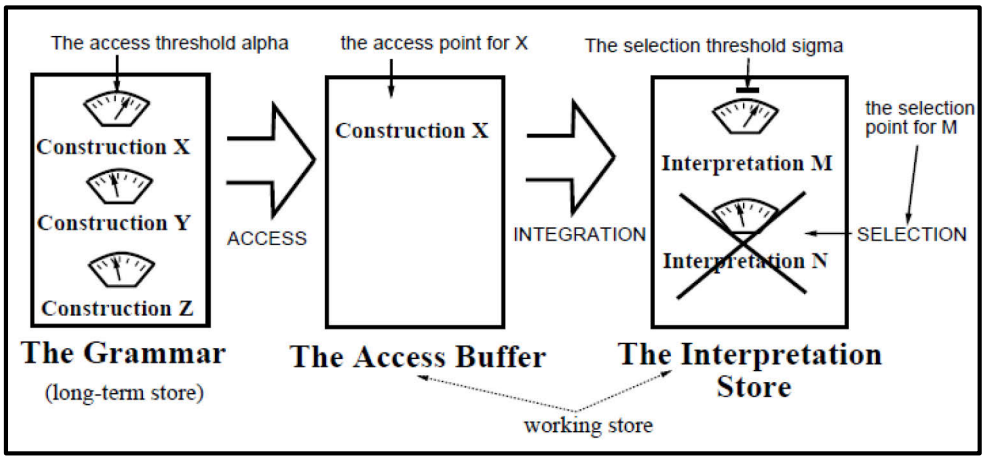


Figure 34: The architecture of Sal (Jurafsky 1992: 9).

Drawing from Jackendoff and Jurafsky, let us now turn to the processing of Adv-S-V_{fin} in the construction-based framework of sentence processing, taking into account experimental empirical evidence concerning the status of V3 sentences. Note that Jurafsky (1992, 1996) develops a detailed computational model that considers numerical values in order to calculate probabilities. Within the scope of this dissertation, I outline the model and its applicability to Adv-S-V_{fin} without calculations but describe the parsing mechanisms on a more abstract level.

In Adv-S-V_{fin} sentences, the first constituent that the parser encounters is the adverbial. The adverbial points to several construction candidates activated in the long-term memory (the constructicon): The DECLARATIVE-Construction is activated because the sentence starts with an element that is not a wh-element. Since the initial element is a non-subject, the TOPICALIZATION-Construction, the FRAME-Construction, the FRAME-SUBJECT-Construction, and the DM-SUBJECT-Construction is activated. Based on frequency, FRAME-SUBJECT and DM-SUBJECT are the least probable candidates. However, up to that point, there is no evidence for the correct interpretation since the initial element is ambiguous. All of the constructions are copied into the access buffer. Hence, multiple constructions are activated simultaneously. Due to the DECLARATIVE-Construction, the probability for the second element to be a verb increases, while both FRAME-SUBJECT-Construction and the DM-SUBJECT-Construction predict a topical subject-NP. As the second element is a subject but not a verb, there is no evidence for the TOPICALIZATION-Construction and FRAME-Construction. Therefore, the constructions are re-ranked with the FRAME-SUBJECT-Constructions and the DM-SUBJECT-Constructions appearing to be the most probable candidates. Both constructions predict the verb to occur as the next element and these expectations are met. It is worth noting that the prosodic realization of Adv-S-V_{fin} might already rule out one of the two constructions. Also, the lexical item that is the

adverbial might increase the probability for one of the two constructions, e.g., *dann* and *danach* might increase the probability for DM-SUBJECT. Lastly, the interpretation store allows for an interpretation of the construction selected after the last element. Competing interpretations are pruned. The process is visualized in Figure 35 below. I assume an additional operation *predict* which is responsible for predicting upcoming elements, which allows for the integration of suprisal theory (Levy 2008), as discussed in section 4.1.2, into the model. For reasons of clarity and comprehensibility, I do not describe in detail the *Integration-process*, which usually combines components of a construction.

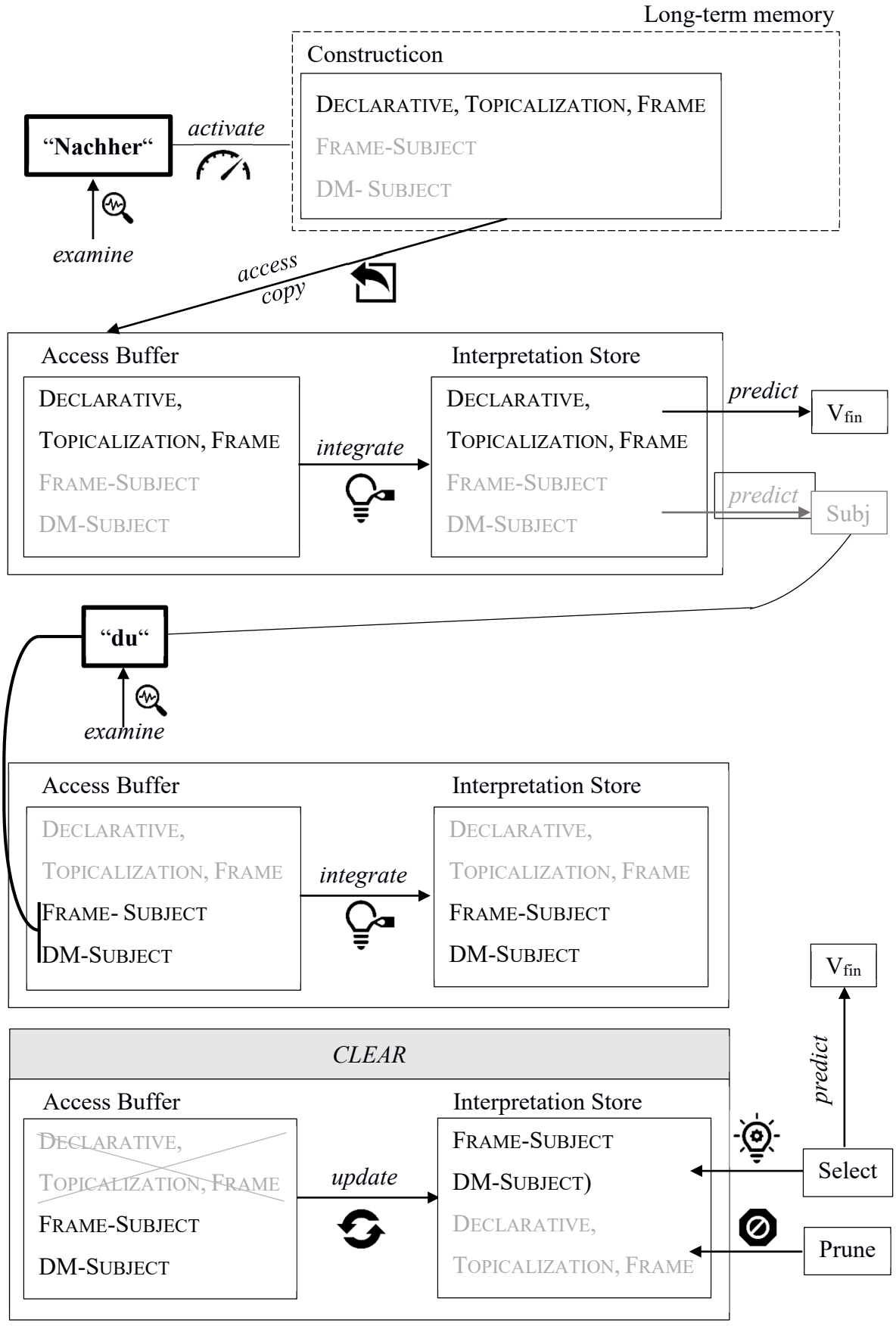


Figure 35: V3 sentences in a construction-based framework of sentence processing.

Does the empirical data confirm the parsing process described above? The data showed that RTs did not differ in the initial constituent. Here, all possible constructions are activated (TOPICALIZATION, FRAME, FRAME-SUBJ, DM-SUBJ). On the second constituent, RTs were significantly slower on the subject in Adv-S-V_{fin} than on the object in Adv-O-V_{fin}. The parser encounters the subject, and re-ranking of the construction applies. This leads to increased RTs. The object does not lead to re-ranking since there is no potential construction that could be ranked higher. There is even more evidence for the FRAME-SUBJECT construction if the adverbial is temporal since the temporal adverbial leads to lower RTs at the preverbal constituent. The fact that no construction can be accessed after the Adv-O-sequence is furthermore supported by high RTs at the verb. If there was something like a general V3-construction, the verb should be expected regardless of the second element, and RTs at the verb should not differ in Adv-S-V_{fin} and Adv-O-V_{fin}. However, only in Adv-S-V_{fin} is the verb expected and integrated into the structure, leading to significantly faster RTs at the verb in Adv-S-V_{fin} in contrast to Adv-O-V_{fin}. Another piece of evidence that Adv-O-V_{fin} is not represented as a construction occurs in the postverbal region. According to surprisal theory, the last element, which is the subject, should exhibit short RTs since the probability increases that the subject occurs while reading the sentence. However, this is not the case. RTs on the subject are significantly higher than the RTs on the object in Adv-S-V_{fin}(-Object).

From the self-paced reading data, it is not clear whether either FRAME-SUBJECT or DM-SUBJECT is activated. As indicated above, assuming that DM-SUBJECT is even more restricted in form, in that it occurs only with specific lexical items, FRAME-SUBJECT is most likely activated and selected if the adverbial is neither *dann* or *danach*. Anticipating the overall construction might facilitate clipping together the different segments because the parser anticipates the representation of the segments in the construction. Hence, it also anticipates the links between the different generative components of the linguistic architecture. The parser anticipates specific interface links and mappings between the components in the segments, which facilitates the processing. If the parser needs to infer links because there is no construction that provides a schema, this could lead to higher reading times, as is the case with Adv-O-V_{fin}. The advantage of the account is that both FRAME-SUBJECT and DM-SUBJECT are linked with each other. This link allows for a certain amount of flexibility in terms of the function of the adverbial. Both constructions share the same surface serialization but they are equipped with different functional properties. Nothing prevents a construction from having both properties in a particular communicative context.

In sum, the empirical findings presented in the last chapters and the findings from the self-paced reading study, in particular, are compatible with the fundamental assumptions of Cognitive Construction Grammar and the model of construction parsing illustrated above.

5.3 Chapter summary

This chapter dealt with the grammatical modeling of V3. I evaluated two different theories based on psycholinguistic evidence, Generative Grammar and Cognitive Construction Grammar. In the discussion of the generative accounts, I focused on the status of the initial adverbial, the subject-restriction and the overall syntactic structure. In addition, I tested an approach to model V3 in Optimality Theory.

The generative analysis revealed the following: The data concerning the status of V3 and the reading time data from the self-paced reading experiment, in particular, supported that the initial adverbial is base-generated in the left periphery. There were no effects of the semantic class of the adverbial in potential trace positions of the modal adverbial, suggesting that the adverbial did not exhibit movement. Higher reading times on the second position in Adv-S-V_{fin} compared to Adv-O-V_{fin} indicated that the preceding adverbial is re-ranked or re-analyzed as a frame-setting adverbial. Syntactic structures that involve a contrastive topic in the second position constitute problems in the structure building process, which is visible in the postverbal area. Therefore, a syntactic structure for V3 must capture the fact that contrastive topics are excluded. A cartographic structure with a designated position for frame-setters (FrameP) and familiar, aboutness, or continuing topics can account for that. Frame-setters would be late-merged and adjoined in FrameP and the subject would move from SpecFinP to SpecContinP, SpecFamP or AboutP. Alternatively, a non-cartographic symmetric approach with an adjoined adverbial on CP also explains the data. In this case, CP recursion needs to be excluded, as suggested by Walkden (2017). The analysis rests on the assumption that the subject fulfills its prototypical function as a topic in the second position, and hence, no designated position for a topic is needed. The optimality theoretical analysis of V3 revealed that the constraints provided by Winkler (2017) for the modeling of apparent multiple prefields in German provide a valuable starting point for V3. The model predicted differences in the acceptability of V2 and V3, but did not make the correct predictions for the difference between Adv-S-V_{fin} and Adv-O-V_{fin}. Further specifying the constraints in terms of information structure could allow for the differences in acceptability and thus the different statuses of Adv-O-V_{fin} and Adv-S-V_{fin}.

I highlighted several conceptual and theoretical challenges in the generative accounts. Most importantly, recent analyses rest on the assumption that V3 is absent in monolingual German.

Hence, the studies attribute V3 to the unique grammatical constitution of Kiezdeutsch and not to grammatical configurations that are rooted in the German syntax. Second, the accounts did not consider that V3 has a spectrum of functions between frame-setting and discourse linking. A theory of grammar needs to explain the variation in function of V3, which recent accounts do not provide. Discourse markers are hardly considered and the generative account does not provide a dynamic structure that can explain the functional spectrum of V3.

I targeted these challenges in the construction-based analysis of V3. Here, I argued that V3 is a construction in its own right since it fulfills specific criteria that provide evidence for this status. I suggested that V3 consists of two constructions: FRAME-SUBJECT and DM-SUBJECT. Both constructions are part of the DECLARATIVE-Construction, and both inherit declarative features, such as assertion and a global falling intonation. The constructions are linked, which accounts for structures that are both frame-setting and discourse linking. Thus, V3 can have both representations at the same time. Lastly, I argued for a processing model of FRAME-SUBJECT and DM-SUBJECT, drawing from Jackendoff (2007, 2013b) and Jurafsky (1992, 1996). In this account, fragments of constructions activate other constructions, and possible candidates are constantly predicted, updated, and ranked. This is in line with the reading time data and fundamental psycholinguistic assumptions. At the second constituent in V3 structures, the DECLARATIVE, TOPICALIZATION, FRAME, FRAME-SUBJECT, and DM-SUBJECT constructions are re-ranked if there no verb occurs after the initial adverbial. This leads to higher reading times on the subject but not on the object in Adv-O-V_{fin}. After re-ranking the possible constructions on the subject position in V3, the verb is expected to occur next. The prediction is fulfilled, and the reading times on the verb are therefore low. In Adv-O-V_{fin}, no prediction can be made since the parser does not predict a construction. The predictions made by the parser allow for an incremental "clipping together" of treelets that constitute the construction. The parser also allows for anticipating construction-specific interfaces between the different components of the architecture of language on the levels of phonological structure, syntactic structures, and conceptual structures.

Chapter 6: Conclusion and Outlook

In this dissertation, I focused on the status of V3 declaratives in German. In order to explore the status, I investigated V3 structures that display an ADVERBIAL >> SUBJECT >> FINITE VERB linearization from the perspectives of language use, acceptability, and processing. Based on these findings, I modeled the grammar of V3, treating it as a test case for two different grammatical frameworks: Generative Grammar and Cognitive Construction Grammar. I argued that V3 can be modeled in both frameworks, but that the construction-based approach allows for greater flexibility of different V3 subtypes.

The analyses benefited from both elicited data and their analysis, and previous research done on V3 structures in German. In previous corpus studies, it has been shown that V3 sentences are infrequent in multilingual speakers, but they are even rarer in monolinguals (cf. Wiese & Müller 2018). However, the structures are greatly systematic as they display specific grammatical, prosodic, information-structural, and functional properties. In addition, they are restricted to (semi-)informal contexts. These factors make V3 a valuable test case for the psychological plausibility of grammatical models, as they deviate from what is usually considered to be part of the core-grammar. Linguistic theory usually relies on the analyses of phenomena that are part of the standard language. Standard language, however, is an idealized variety that lacks patterns that occur in other varieties, e.g., in informal language. V3 is a case in point for these phenomena representing natural language and is thus a valuable source for linguistic theories. They challenge existing models and provide an insight into the architecture of language and the representation of linguistic structures.

In order to obtain these insights, empirical data is crucial and must be considered when modeling the representation of structures. Language is a cognitive asset, and therefore linguistic theory must strongly rely on empirical data that reflect the cognitive processes that constitute language. In this dissertation, I combined theoretical considerations and psycholinguistic evidence to assess the status of V3 and its grammatical representation. In pursuit of this attempt, I focused on the following research questions:

Main RQ	What is the status of V3 sentences in German?	
RQ 1	What are the structural and functional properties of V3?	*Chapter 2*
RQ 2	How acceptable is V3?	*Chapter 3*
RQ 3	How is V3 processed?	*Chapter 4*
RQ 4	How can the grammar of V3 be modeled?	*Chapter 5*

The research questions corresponded to the chapters of the dissertation and provided the following insights into the status of V3. The literature revealed that V3 is greatly restricted in its form, in that there is hardly any deviation from the ADVERBIAL >> SUBJECT >> FINITE VERB serialization. The adverbial can occur in different semantic classes but preferably is temporal or local, while the subject is predominantly realized as a personal pronoun. Both constituents lack accents and pauses; however, sentences with pauses between both elements exist. In a corpus study, I provided more insights into the grammatical constitution of the verbal and the postverbal area of V3. The structure predominantly exhibits transitive main verbs in present tense with overt objects occurring either immediately after the verb or in another postverbal position.

On the level of information structure, adverbials and subjects correspond to frame-setter and topic, respectively. Information structure has been reported to be the driving force behind V3. The initial adverbial also can take the function of a discourse linker. The frame-setting and discourse linking function of the adverbial can co-occur in the same V3 structure, and thus the initial adverbial can simultaneously function on different linguistic levels. I argued for a continuum with frame-setting V3 and discourse-linking V3 as the two poles. This finding is extremely relevant for the status of V3 and its grammatical representation because a grammatical theory needs to consider the different configurations in modeling the structure.

I furthermore argued that there is no evidence to treat V3 as a speech error in the form of a self-correction (no syntactically incomplete structure, no break in the turn, no replacement of a reparandum), and I highlighted that Adv-S-V_{fin} orders differ from ASVO in language learners. Moreover, V3 can be found in earlier stages of German, such as Old High German, Middle Low German, and Early New High German. These findings are of great interest regarding the status of V3 because they strongly suggest that the structure has a grammatical representation that is rooted in German grammar. It seems that V3 systematically makes use of the potential of the German prefield and can override the V2 preference in German declaratives. V3 exploits the fact that the prefield is the prototypical host of both, frame-setters and topics and achieves an optimal ordering of information. In addition, V3 sentences fulfill the general subject-first/topic-first preference that can be observed across languages.

The results from chapter 2 did not only reveal interesting aspects concerning the status of V3 from the perspective of language use. It was also highly relevant for the studies presented in the following chapters that shed light on the status of V3 from different angles. The insights

from the structure, function, and use were the basis for the stimuli in the acceptability judgments task and the self-paced reading experiment.

Chapter 3 explored the status of V3 from the perspective of acceptability. The chapter compared Adv-S-V_{fin}, Adv-O-V_{fin}, subject-initial V2 (S-V2), object-initial V2 (O-V2), and adverbial-initial V2 (A-V2). The study tested speakers whose only family language is German (i.e., they were monolingual speakers of German). The data show that there are differences in the acceptability of Adv-S-V_{fin} and Adv-O-V_{fin}. While both structures were rated as significantly less acceptable than the V2 structures, the two V3 structures also differed. Adv-S-V_{fin} was rated significantly more acceptable than Adv-O-V_{fin}. This indicates that V3 structures as such are not equally unacceptable but certain factors allow for specific V3 structures. In the case of Adv-S-V_{fin}, context sentences that preceded the items allowed for the interpretation of Adv-S-V_{fin} as FRAME-SETTER >> TOPIC >> COMMENT sequences. Both S-V2 and O-V2 were equally acceptable, pointing to the fact that object topicalization was, in principle, possible with the stimuli used in the study. The fact that object topicalization was not an option in V3 indicates that Adv-O-V_{fin} is not accessible as a structure; hence, it does not have a mental representation and topicalized objects in the second position are excluded. Taken together, the findings present a strong case for the different statuses of Adv-S-V_{fin} and Adv-O-V_{fin} and possibly a mental representation for Adv-S-V_{fin} but not for Adv-O-V_{fin}.

The study furthermore revealed interesting insights into the acceptability of certain V2 structures. To the best of my knowledge, no study so far has systematically investigated the acceptability and processing of the three V2 types, S-V2, O-V2, and A-V2. Most studies exclusively focus on subject- versus object-initial V2 structures. However, the acceptability judgment tasks revealed that A-V2 sentences were judged as significantly more acceptable than the other V2 structures. This could be due to the experimental set-up (narrative character which triggers initial adverbials) but it could also be considered as strong evidence for the preference for scene-setters in the first position (cf. Speyer 2010).

From a methodological perspective, it was striking that a difference in the acceptability of Adv-S-V_{fin} and Adv-O-V_{fin} occurred in a written acceptability judgment task, as the structures are, at least for monolingual German, attested in spoken language only. This indicates that the perceived difference in acceptability between Adv-S-V_{fin} and Adv-O-V_{fin} is very strong. The study also showed that the stimuli that were used in the study triggered subject-initial, object-initial, and Adv-S-V_{fin} structures. Hence, the items were suitable for the self-paced reading study. Consequently, the study functioned as a pre-study for the self-paced reading study.

Chapter 4 built on the outcome of the preceding sections. It dealt with the status of V3 from the perspective of sentence processing. I presented data from a self-paced reading experiment conducted with monolingual speakers of German using the stimuli from the acceptability judgment task. The data revealed that overall, the Adv-S-V_{fin} structures were processed similarly to V2 sentences. Drawing from the data, I argued that verb placement is not the crucial factor in the overall reading times but rather the preverbal element: Adv-O-V_{fin} sentences evoked higher reading times than Adv-S-V_{fin}. The study also showed that the immediate preverbal constituent was read faster with initial temporal adverbials in V3 structures and that the verb in Adv-O-V_{fin} was read significantly slower than the verb in Adv-S-V_{fin}. The immediate preverbal constituent was read slower in Adv-S-V_{fin} compared to Adv-O-V_{fin}. I argued that this is due to a re-ranking or re-analyzing of possible structures, expected from the parser. The parser predicts a possible Adv-S-V_{fin} structure but not a possible Adv-O-V_{fin} structure. Postverbally, the subject in Adv-O-V_{fin} was read significantly slower than the subjects in all other conditions and other postverbal constituents. This indicates that the parser is unable to predict upcoming constituents in Adv-O-V_{fin}. As opposed to Adv-O-V_{fin}, Adv-S-V_{fin} appears to be triggered by coarse-grained and fine-grained frequency, and by the subject-first preference. These factors allow for predictions and expectations from the parser and they reflect that Adv-S-V_{fin} follows general grammatical and psycholinguistic preferences, which might reflect a mental representation of Adv-S-V_{fin} in contrast to Adv-O-V_{fin}.

These findings directly led to chapter 5, where V3 was put into context with different models of grammar. I focused on two fundamentally different frameworks: Generative Grammar and Cognitive Construction Grammar. The chapter showed that the empirical data support both accounts. The most challenging question for both grammatical models was why the preverbal constituents in Adv-X-V_{fin} lead to different reading times on the verbs and why the immediate preverbal elements differed in reading times. I argued for a cartographic approach in the generative framework with a designated position for a non-contrastive topic. In such an account, only aboutness, familiar, or continuing topics are allowed in the second position, ruling out topicalized objects that automatically get a contrastive reading when appearing preverbally. An alternative approach with CP adjunction of the adverbial in the sense of Walkden (2017) also seems reasonable. The data from the self-paced reading experiment suggested base-generated adverbials rather than moved adverbials. However, Generative Grammar is challenged by the fact that V3 can have frame-setting or discourse-linking adverbials, and hence different

functions with different degrees on this continuum. Generative analyses did not consider this fact. Additionally, the analyses rely on the fact that V3 is non-existent in monolingual German.

Within the construction-based framework, I argued for V3 to be a construction in its own right, which is related to the DECLARATIVE-construction and linked to a FRAME-construction. Both frame-setting V3 and discourse-linking V3 can be represented in two constructions that differ in function and possibly prosody. I called these constructions FRAME-SUBJECT and DM-SUBJECT constructions. Both constructions are linked with each other and inherit features from the DECLARATIVE-construction and the DM-Construction, respectively. This link between both constructions allows V3 to take all points on the continuum mentioned above, fulfilling frame-setting and discourse-linking functions to every degree possible. Both constructions interact with each other, as the constructicon is a dynamic space that changes constantly. The two constructions are specified in terms of their occurrence in language use, i.e., they are equipped with the "(semi-)informal" feature on a specific layer. In this way, they are not restricted to Kiezdeutsch but are also accessible in (semi-)informal monolingual German. Finally, I analyzed V3 within the Sal model of construction processing (Jurafsky 1992, 1996). The model is compatible with the Tripartite Parallel Architecture (Jackendoff 1997, 2002). Treelets of constructions are integrated and activated constructions in the constructicon are pruned or further forwarded to the processing system. In V3, the FRAME-SUBJECT and DM-SUBJECT are activated when the parser encounters the subject. Up to this point, V2 is predicted. At the subject, the parser re-ranks potential candidates, leading to higher reading times at the subject. At the object, no such effect was observed but higher reading times of the verb compared to Adv-S-V_{fin} occurred. This points to the fact that the parser activates the FRAME-SUBJECT and DM-SUBJECT construction only in Adv-S-V_{fin}.

Taken together, the studies conducted in this dissertation strongly suggest that V3 is mentally represented as a syntactic structure or a construction. It makes use of grammatical preferences in German and general cognitive processes, and there is ample evidence that V3 is thus part of German grammar that has most likely been present in the language for centuries.

The findings presented in this dissertation contribute to linguistic research in many respects. They have shown that structures that are not part of core-grammar, very low in frequency and that are judged to be less acceptable than related structures from the core-grammar, do not constitute problems for the processing system as long as they follow specific conditions. In the case of V3, these conditions concern the context and grammatical and functional properties. The dissertation also shows that investigating structures that deviate from the standard language

provides highly fruitful insights concerning grammatical modeling and the linguistic architecture. Empirical evidence from psycholinguistic data can be used as the basis for modeling grammar in different frameworks. Furthermore, investigating the status of a specific structure from different angles can reveal challenges and merits of different grammatical frameworks and theories. In this respect, the dissertation highlighted the necessity of empirical data and methodological broadness as a valuable resource for grammatical modeling. Taking into consideration authentic data in experimental studies is often challenging. In these experiments, linguistic phenomena need to be controlled for and they need to be systematically tested to avoid the influence of confounding factors. Thus, it is essential to exploit several methods that partially contribute to answering the research question from different perspectives. In this dissertation, I developed test items drawing from corpus findings in order to achieve this goal. From a methodological perspective, it is rather striking that the reading time experiment revealed effects, given the fact that V3 predominantly occurs in spoken language and that it so blatantly goes against standard grammar.

Apart from these direct consequences, the dissertation has several practical implications in the fields of second language acquisition and language teaching. The dissertation raises the question of whether language learners could benefit from teaching grammatical variation and how language learners deal with grammatical variation when being confronted with it. It has been argued that ASVO occurs at a certain stage in the acquisition process. However, second language learners come across V3 structures on a daily basis, even in spoken mass media. On the surface, the structures are similar and language learners might infer the functional dynamic behind V3. Further studies are needed in order to better understand the effects that naturally occurring V3 input has on language learners. A first attempt has been made by Bunk & Gamper (2020), who investigate Adv-S-V_{fin} and Adv-O-V_{fin} in second language learners' production and comprehension. They found that V3 productions are rare in B1 and B2 speakers, but when participants produced V3 structures, they predominantly produced Adv-S-V_{fin} orders. More interestingly, both speaker groups differed in processing: While B1 speakers displayed high reading times in Adv-O-V_{fin} in almost all critical regions, B2 speakers display higher reading times only at the verb in Adv-O-V_{fin}. Adv-S-V_{fin}, however, was similar to V2 in this respect. Assuming that in advanced learners, the V2 rule strengthens, we expected the opposite. Both V3 sentences should have displayed high reading times in all regions. Instead, the reading times of B2 learners resembled the reading times of the monolingual speakers presented in this dissertation. These findings indicate that the grammar of advanced learners also reorganizes in

terms of deviating structures even though these structures are assumed to be non-target-like. Either this is a by-product of acquiring word order, or it is the result of contact with the everyday input that exhibits V3. The last option seems more likely as B2 learners react differently to Adv-O-V_{fin} than to Adv-S-V_{fin}. More research needs to be done in this respect to shed more light on V3 and word order variation in language learners. Expanding the investigation to more advanced C1/C2-learners could prove to be highly fruitful in understanding word order variation in learners.

Another somewhat related open topic is the processing of V3 in multilingual speakers. It would be very interesting to examine whether multilingual speakers display the same patterns in acceptability and processing as their monolingual peers. It might also be worth investigating the possible influence of the other L1. English displays ASVO, which, again, resembles V3 on the surface. Other languages, such as Turkish, have a verb-last structure, which makes an influence from these languages highly unlikely. Investigating the possible impact of the L1 might be extremely revealing in terms of the status of V3 in German. In the acceptability judgment task in this dissertation, data from multilingual speakers have been collected as a by-product of the elicitation procedure. This data could provide a starting point for the cross-linguistic investigation.

The dissertation raises a number of other interesting research questions that go beyond the topic of the dissertation but that concern both grammatical theory and psycholinguistics. For instance, what could only be briefly dealt with in this project is the status of adverbial in V3. There are hints and theoretical arguments that point to base-generated adverbials in V3 sentences, but more empirical evidence is needed to clarify this in detail. A priming experiment, in the manner of Clahsen & Featherston (1999) would be one possibility to tackle this topic.

Related to this question is the more nuanced differentiation between frame-setting adverbials, discourse-linking adverbials, and possibly other types, e.g., segmentation marking adverbials. This topic could highly benefit from a more detailed prosodic analysis, as prosody is, in some cases, involved in the disambiguation of initial adverbials.

Another topic that could not be investigated in this dissertation is the impact of registers on the processing and acceptability of V3. Based on the literature, V3 should be more acceptable in informal situations than in formal situations, which might also be visible in processing studies. However, the setup for this kind of investigation would require to account for formal vs. informal situations. A comprehensive adaptation of the Language Situations Setup (Wiese

2019) could be a promising starting point for developing a psycholinguistic setup that allows for comparing the processing of word order variation in registers.

The dissertation has shown that V3 structures provide a very fruitful and revealing base for several linguistic fields. Their investigation allows for insights into various domains in syntax, psycholinguistics, pragmatics, and sociolinguistics, to name but a few. V3 illustrates that investigating variation can enrich or even change our perspective on what has been considered a rigid restriction in syntax for a long time. In this way, V3 shows that embracing variation and using it as a resource is essential for challenging and adjusting traditional preconceptions.

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